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PRIMARY BILIARY CIRRHOSIS*

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"La question de la cirrhose hépatique, si simple autrefois dans sa précision trompeuse, est devenue de plus en plus complexe".—V. Hanot, 1892.

THE term biliary cirrhosis, although often loosely used, is, as has been pointed out by Boyd,[1] a convenient one inasmuch as it indicates that the cause of the cirrhosis in these cases is thought to be associated with an inflammatory reaction in or about the fine intra-hepatic bile ducts rather than with disease of the parenchymal cells of the liver. The presence of such a reaction in this situation is likely to interfere with the free passage of bile through these tiny canaliculi and to cause the laying-down of excessive amounts of fibrous tissue in and about the bile ducts in the portal spaces of the liver. It is these changes which produce both the clinical and anatomical features of biliary cirrhosis.

Such a reaction in the small ducts may be secondary to inflammation or obstruction of the large extra-hepatic bile channels or it may be due to primary disease of these finer bile passages themselves. The various etiological possibilities are given in the following comprehensive classification of biliary cirrhosis which is employed by Karsner.[2]

BILIARY CIRRHOSIS CLASSIFICATION (KARSNER[2])

1. Due to extra-hepatic obstruction of the large bile ducts:
   - (*a*) cholestatic
   - (*b*) cholangitic
2. Due to intra-hepatic obstruction of the finer bile channels:
   - (*a*) cholangitic
   - (*b*) cholangiolitic
   - (*c*) xanthomatous
   - (*d*) zooparasitic

In this communication it is not proposed to discuss the first group nor to enter into the argument about whether or not simple obstruction of the common duct, with or without infection, can lead to cirrhosis of the liver. The cases which are to be described belong rather to the second large group in which the extra-hepatic biliary channels are patent and unobstructed and the mechanical obstruction, if it exists at all, is present, not in the large bile ducts, but in the smallest interlobular branches of the biliary tree. This is generally a diffuse process which involves the whole intra-hepatic biliary tract. It leads to marked enlargement of the liver and spleen and to the occurrence of a persistent jaundice. Because of these findings the resulting clinical condition is often called hypertrophic biliary cirrhosis with chronic jaundice. We have preferred to call it simply *primary biliary cirrhosis.* Although in the later stages the parenchymal cells of the liver may become severely damaged they are relatively unharmed in the early stages. It is not surprising then to find that the functional abnormalities present, in the beginning at least, are those of an obstructive jaundice rather than those of hepato-cellular insufficiency. What must be realized in these patients is, of course, that the obstruction is intra-hepatic and not extra-hepatic and that no beneficial result can be expected from any form of surgical interference. This condition of primary biliary cirrhosis is relatively rare but it is of importance because patients who have it are so frequently thought to be suffering from some form of extra-hepatic obstruction and are therefore subjected to needless and often dangerous surgery.

CASE REPORTS

The clinical and other findings in such patients can best be illustrated by the following case report:

CASE 1

R.G., a male, aged 50, was well until January, 1936, when he suffered from some sharp knife-like pains in the lower chest on both sides. These lasted for four days only and did not return. There were no other symptoms.

In February, 1936, about one month later, his skin and scleræ were noted to be yellow. There had been no

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further pain. There was no nausea, vomiting, loss of appetite or other gastro-intestinal symptoms. He noted some itchiness of the skin. He was a little tired but noticed no other impairment of his general health. There was no history which suggested any previous hepatic or biliary tract disease. His jaundice and itching continued.

On July 20, 1936, he was admitted to hospital. On admission he was found to be moderately jaundiced. There were no telangiectases or xanthomas. The liver was large and firm. There were no enlarged abdominal veins. The spleen was not palpable. There was no evidence of ascites.

On July 28, 1936, because it was felt that he was suffering from an obstructive jaundice, a laparotomy was performed by the surgical staff. No evidence of obstruction in the extra-hepatic bile ducts could be found. The spleen was mildly enlarged. A specimen of the liver taken for biopsy showed the microscopic picture of an inflammatory reaction and increased fibrosis in the portal areas (Fig. 1*) and was diagnosed as showing an early atypical biliary cirrhosis.

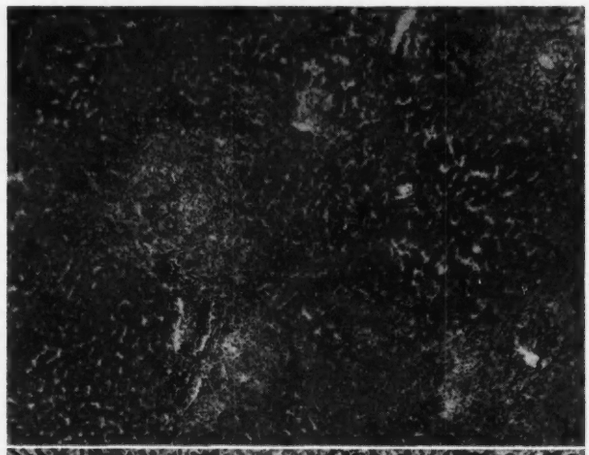
He recovered satisfactorily from his operation and he was seen after discharge at regular intervals through the kindness of his family physician, Dr. Hession, of Toronto. His symptoms and signs continued and became somewhat more marked during 1937, 1938 and the early part of 1939, but in spite of his deep jaundice he felt reasonably well and continued at his work. The liver remained about the same but the spleen gradually increased in size finally reaching a hand's breadth below the left costal margin. Ascites was noted for the first time in May, 1939, and his downhill course became definitely more rapid. He finally died in September, 1939, some 3½ years after the onset and following a short period of severe anorexia and loss of weight.

At autopsy the liver was enlarged (2,050 gm.) and firm. The extra-hepatic biliary channels were unobstructed.

Microscopic examination of the liver (Fig. 2) showed that the inflammatory process in the portal areas had continued and had resulted in a diffuse perilobular and intra-lobular fibrosis of the liver of the Hanot type.

* The authors wish to express their grateful thanks to Professor William Boyd, Head of the Department of Pathology in the University of Toronto and to the members of his staff, and particularly to Dr. T. C. Brown, who so kindly re-examined and reported on the microscopic sections of these cases and who prepared the photomicrographs for publication.

During the course of this patient's illness certain laboratory examinations were carried out, the results of which are given in Table I. The serum van den Bergh was found to be persistently and increasingly elevated. Bile in large amounts was constantly in the urine as was also urobilin as long as the exclusion of bile from the



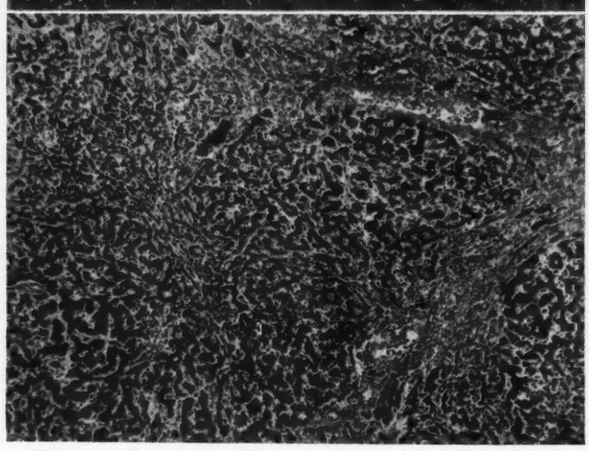


Fig. 1. (Case 1).—Photomicrograph of liver biopsy, taken 6 months after onset of jaundice.

Fig. 2. (Case 1).—Photomicrograph of liver obtained at autopsy, 3½ years after onset of jaundice.

TABLE I.

CASE 1. R.G. (MALE) TORONTO GENERAL HOSPITAL A16003

CLINICAL DIAGNOSIS: PRIMARY BILIARY CIRRHOSIS

BIOCHEMICAL OBSERVATIONS

Date	*Serum V.D.B.*	*Urine*		*Color of stools*	*Total serum cholesterol*	*Serum alk. phosphatase*	*Serum protein*			*Oral galactose tolerance test*
		Bile	*Urob.*				*Tot.*	*Alb.*	*Glob.*	
	units				*mgm. %*	*K. J. units*	*gm. %*	*gm. %*	*gm. %*	*gm. galac. excreted*
July 22/36....	16.0	++	Tr.	Normal		68				0.09
July 28/36....	Laparotomy. No obstruction of common bile duct									
August 10/36..	14.0	++	+			92				1.7
January 16/37.	16.0	+++	Tr.	Normal	880	123				
August 14/37..	20.0	++++	++	Pale yellow		70				
April 23/38...	29.0	++	0	Light grey	575		6.8	4.1	2.7	0.34
October 15/38.	36.0	++++	0		425	91				
February 4/39.	40.0	++++	0	Greyish white			6.4	3.9	2.5	
August 12/39..	40.0	++++	0	Greyish white	452	126				
September 19/39.....	Died. Autopsy: Hypertrophic biliary cirrhosis. No extra-hepatic obstruction or inflammation.									

gastro-intestinal tract was not complete. The galactose tolerance test yielded normal results and the serum protein estimations showed no abnormality beyond a mild lowering of the serum albumin. On the other hand both the serum alkaline phosphatase and the total serum cholesterol were grossly elevated to levels which were many times the normal value. The hyperphosphatasæmia persisted during the whole course of the illness but the level of the cholesterol decreased gradually as time went on, reaching, on the last examination 1 month before death, a value which was only twice the normal.

A number of similar cases, which are summarized in Table II, have been studied and followed during the past few years. It is seen from this table that the sexes are equally represented and that the age of onset is remarkably uniform. The total duration of the jaundice has varied from ten months to twelve years, the average (if one excepts the twelve year patient) being just under three years. Three patients are still living. Six, at some time during their illness, have been subjected to surgical exploration and the biopsy specimens taken on such occasions have fortunately been available for study. In three other cases there has not been pathological confirmation of the clinical diagnosis but the clinical course and findings in these have been so characteristic that they undoubtedly belong to this group. In most of the cases the jaundice appeared gradually and in only one was the initial illness felt at the time of onset to have been an acute infective hepatitis. In two cases unexplained itching was the initial symptom. Two other cases had had ulcerative colitis for many years preceding the appearance of jaundice.

The outstanding clinical and biochemical abnormalities of these ten cases are shown in Tables III and IV and are summarized in Table V. Mild to severe visible jaundice was present in all cases as was also itching of varying degrees. True colicky pain was present in only one case and, although mild fever was commonly noted, high fever was uncommon in this group during the time that they were under observation. Multiple xanthomatosis was prominent in three cases and in two others it was present but to a lesser degree. True spidery telangiectases were noted in only two cases. A large firm liver was present in all and the spleen, although never huge, was also readily palpable in all these patients. Ascites was encountered in four of the ten cases but in each instance it was a late phenomenon. Hæmatemesis of severe degree occurred in one case and to a much lesser degree in one other.

Laboratory examinations on these patients have shown an elevation of the direct reacting serum bilirubin in all 10 cases, definite urobilinogenuria in 9 of the 10 cases, hypercholesterolæmia in 7 cases and hyperphosphatasæmia in all 10. A mild lowering of the serum albumin was found in 4 and a moderate or marked elevation of the serum globulin was present in 5 cases. The galactose tolerance test was found to be positive in only 2 cases. The lower level of the serum cholesterol in the 3 cases who showed low or normal values may

TABLE II.
PRIMARY BILIARY CIRRHOSIS
SUMMARY OF CASES

No.	*Pt.*	*Sex*	*Age at onset*	*Present status*	*Duration of jaundice*	*Pathological diagnosis*	*Remarks*
					months		
1	R.G.	M.	50	D	42	Biliary cirrhosis	Gradual onset. Surgical biopsy. Autopsy.
2	A.D.	F.	39	A	31+	Early biliary cirrhosis	Gradual onset. Marked Xanthomatosis. Surgical biopsy.
3	A.S.	M.	40	A	32+	Early biliary cirrhosis	Gradual onset. Initial symptom itching. Surgical biopsy.
4	H.L.	F.	41	D	60	Biliary cirrhosis	Onset with colicky pain. Surgical biopsy. Autopsy.
5	S.W.	M.	40	D	168	Biliary cirrhosis	Ulcerative colitis 28 yrs. Mild jaundice 14 yrs. Xanthomatosis. Autopsy.
6	P.I.	M.	28	A	36+	Biliary cirrhosis	Initial illness diagnosed acute infectious hepatitis. Surgical biopsy.
7	R.S.	M.	46	D	10	.....	Sudden onset deep jaundice. Marked xanthomatosis. No autopsy.
8	J.B.	F.	27	D	13	.....	Ulcerative colitis 18 yrs. Jaundice and large liver 1 yr. No autopsy.
9	S.H.	F.	50	D	18	.....	Gradual onset jaundice. No autopsy.
10	S.E.	F.	38	D	60	Biliary cirrhosis with multilobular cirrhosis	Onset with itching. Moderate xanthomatosis. Surgical biopsy.

be accounted for at least in part by the fact that their condition was far advanced at the time of the examination and with increasing hepato-cellular damage the level of the blood cholesterol tends to fall.

The pathological lesions present in the livers of this group of patients are under review by Professor Boyd and his department in the University of Toronto and will be reported on by them at a later date. In general the microscopic examinations have shown evidence of an inflammatory process, characterized by a round cell infiltration and increasing fibrosis, in and about the portal spaces, and evidence of obstruction and obliteration of the fine interlobular bile capillaries.

TABLE III.
PRIMARY BILIARY CIRRHOSIS
CLINICAL MANIFESTATIONS

No.	*Pt.*	*Jaundice*	*Pruritus*	*Colicky pain*	*Fever*	*Xanthoma*	*Spiders*	*Clubbing of fingers*	*Large liver*	*Large spleen*	*Ascites*	*Hæmatemesis*
1	R.G	++++	+++	0	0	0	0	0	++++	+	+ (Late)	0
2	A.D.	+++	++	0	98–99	++++	0	0	++++	+	0	0
3	A.S.	++	++++	0	0	0	0	0	+	+	0	0
4	H.L.	++	++	++++	99–100	0	++	0	++	++	+ (Late)	++++
5	S.W.	++	++++	0	-	+++	0	0	++++	+	0	0
6	P.I.	++	++	0	0	+	0	0	+++	+	++++ (Late)	+
7	R.S.	++++	++++	0	100–101	++++	0	0	++++	+	0	0
8	J.B.	++	+++	0	-	0	0	0	++++	+	0	0
9	S.H.	++++	++	0	99–100	0	0	0	++++	+	0	0
10	S.E.	++	++++	0	98–100	++	+++	0	++++	+	+++ (Late)	0

TABLE IV.
PRIMARY BILIARY CIRRHOSIS
LABORATORY OBSERVATIONS

No.	*Pt.*	*Serum V.D.B.*	*Urine urobil.*	*Color of stools*	*Serum cholesterol total*	*Serum alk. phosphatase*	*Serum proteins* (3) (4) *Total*	*Alb.*	*Glob.*		*Galactose tolerance (oral)*
		units			*mgm. %*	*K.J. units*	*gm. %*	*gm. %*	*gm. %*	*13½% fraction*	
Normal		0.4–1.0	.....	.....	170–250	5–10	6.2–7.8	4.0–5.7	1.6–2.5	0	Negative
Portal cirrhosis		Varies usually low	+++	Normal	Low-normal	10–30	5.3–9.3	2.5–5.4	2.6–6.1	0–2.5	Varies
1	R.G.	16–40	0–++	Norm-Pale	450–880	68–126	6.8	4.2	2.6	—	Negative
2	A.D.	8–16	++	Normal	600–660	49–80	9.4	4.1	5.3	++	Negative
3	A.S.	3–8	+++	Normal	290–330	33–89	7.8	5.0	2.8	0–+	Negative
4	H.L	4–6	+	Normal	128–172	36–80.	6.0	3.8	2.2	0	Negative
5	S.W.	3–30	+	Normal	66–180	64	8.5	3.6	4.9	+	Negative
6	P.I.	4–40	+	Normal	180–500	48–99	7.4	3.6	3.8	+	Negative
7	R.S.	40–50	0	Pale	360–1140	27–80	—	—	—	—	Negative
8	J.B.	8–11	++	Normal	226–270	78–100	7.4	4.7	2.7	0	Negative
9	S.H	10–50	0–+	Pale	700–930	35–84	7.2	4.1	3.1	0	Positive
10	S.E.	2–14	++	Normal	254–600	20–37	8.0	3.3	4.7	++	Positive

DISCUSSION

It was this syndrome of chronic jaundice with an enlarged liver and spleen which Hanot[5, 6] described over 70 years ago and for which the name "Hanot's cirrhosis" was later proposed.[7] Since that time many clinical examples of this disease have been reported but evidently the precise microscopic findings which Hanot described have only rarely been encountered.[8] There is considerable confusion as to what should or should not be called Hanot's cirrhosis and various pathological lesions have been found in patients exhibiting this clinical syndrome. In some cases the morphological lesion has been that of an ordinary portal cirrhosis.[9, 10] Klemperer[11] has reported what he calls a *chronic intrahepatic obliterating cholangitis* and Rössle,[12] Karsner,[2] and more recently Watson and his co-workers[13, 14] have described a *cholangiolitic cirrhosis.* Still another variety is the *xanthomatous biliary cirrhosis* described in 1938 by Thannhauser and Magendantz[15] in which the changes in the liver were at first thought to be due to the presence of xanthomatous lesions in the bile ducts, a belief which has recently been abandoned.[16] MacMahon,[17] who has studied some of Thannhauser's patients from a pathological point of view, has reported that the livers of these cases are the site of what he calls a *pericholangiolitic biliary cirrhosis.* He expresses the opinion that in this type of cirrhosis the retention and regurgitation of bile,

the appearance of jaundice, and probably the other manifestations of this syndrome are adequately explained by the destruction of the terminal bile ducts and liver cells and the proliferation of granulation tissue and subsequent fibrosis in the portal areas. Certainly the clinical syndrome of multiple xanthoma, jaundice and hypercholesterolæmia has for many years been known to occur at times in cases of long standing jaundice caused by a variety of forms of *extra-hepatic* obstruction.[18, 19] It has been noted even in cases of portal cirrhosis[10] and the opinion of the present writers is that the xanthomatosis exhibited by some of the patients in this present series, is simply due to long standing *intra-hepatic* obstruction and is a secondary and not a primary phenomenon.

TABLE V.
PRIMARY BILIARY CIRRHOSIS
10 CASES

Clinical Manifestations	*Cases*
Jaundice	10
Pruritus	10
Colicky pain	1
Fever	5
Xanthoma	4
Telangiectases	2
Clubbing of fingers	0
Large liver	10
Large spleen	10
Ascites	4
Hæmatemesis	2
Biochemical Abnormalities	*Cases*
Direct reacting V.D.B	10
Urobilinogenuria	9
Hypercholesterolæmia	7
Hyperphosphatasæmia	10
Hypoalbuminæmia	4
Hyperglobulinæmia	5
13½% globulin	5
Positive galactose tolerance test	2

In these cases of so-called biliary cirrhosis most agree that the pathological picture is one of periportal inflammation and fibrosis. The etiology of this inflammation is obscure. Watson and his co-workers[13, 14] have related it to an antecedent jaundice—which they consider to have been probably an acute infectious hepatitis—in 5 out of the 9 cases which they have recently described with cholangiolitic cirrhosis. Such an apparent correlation was not seen in our group of which only one case gave a history suggesting a previous infectious hepatitis. Nor has there been any suggestion that alcohol, dietary or lipotropic deficiencies, or exposure to hepato-toxic drugs or chemicals has played any part in the causation of the cirrhosis present in the patients reported in this paper.

The biochemical abnormalities which we have noted—namely the high incidence of hyperphosphatasæmia and hypercholesterolæmia—are similar to those already described by Watson and his group.[13] In the patients which they have reported, however, a constant hyperglobulinæmia was found and there was no significant change in the level of the serum albumin. In our series definite hyperglobulinæmia was found in only 50% of the cases examined and in 4 of the 10 cases there was a definite hypoalbuminæmia.

No treatment is known which favourably influences the course of the disease. Periods of apparently spontaneous improvement may alternate with periods of more rapid progression of the condition. Low cholesterol diets have been advocated for the treatment of those cases in which the serum cholesterol is high but quite marked decreases in serum cholesterol levels have been observed in some of the cases of the present series even though the cholesterol content of the diet was not restricted. We have usually employed a regimen, similar to that used in the treatment of other forms of cirrhosis, which includes a prolonged period of rest, a high carbohydrate high protein diet, and the administration of large amounts of vitamin B complex, but have not observed any striking or sustained benefit.

SUMMARY

The combination of persistent jaundice and itching with hyperphosphatasæmia and hypercholesterolæmia which characterizes primary biliary cirrhosis always suggests an obstructive lesion and unless the possibility of the presence of this form of cirrhosis is considered a diagnosis of extra-hepatic obstruction is likely to be made. The lack of suggestive antecedent history, the relatively low level of the jaundice at the outset, the large liver without gross irregularities, the palpable spleen, and in some instances at least, evidence of parenchymal cell involvement, will suggest however an intra-hepatic lesion and will frequently allow the correct diagnosis to be made on clinical grounds alone.

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A NEW VIEW ON THE USE OF DICOUMAROL IN THE PREGNANT PATIENT*

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THIS is a report of a preliminary study of anticoagulant therapy administered to a number of pregnant women presenting a history and/or evidence of venous disease. As the series developed the procedure of administering dicoumarol earlier and earlier in the puerperium evolved until the present regimen of predelivery administration of dicoumarol was established.

It is admitted that embolic phenomena account for a very small percentage of maternal fatalities. Indeed, they are rare. Everyone has seen the patient, however, who as a reminder of her pregnancy is burdened with a chronically swollen, uncomfortable or even painful leg due to phlebitis. It was the hope in commencing this study that a form of treatment using an anticoagulant might be evolved whereby these morbid conditions might be prevented.

Preliminary discussions with others regarding the advisability of the use of dicoumarol during the last trimester, during labour or in the immediate postpartum period gave considerable concern. One eminent authority gave us to understand that in his considered opinion such use of anticoagulants would be a most dangerous procedure, as blood loss would most likely be quite marked and possibly uncontrollable. There has been a great deal written on the indications for the use of anticoagulants in the treatment of venous disease. However, following a review of a considerable number of articles, one was impressed with the fact that there was almost total absence of any reference to thrombophlebitis or phlebothrombosis or their complications in the pregnant patient. This is in spite of the fact that Allen, Barker and Hines[1] state that in the United States thrombophlebitis occurs after 0.4 to 1% of deliveries.

Fortunately venous thrombosis has its origin most frequently in the leg. In fact 95% of emboli, other than those of cardiac origin, arise in the veins of the lower leg. Many cases remain local and heal, some being recognized and some not. Those that do not heal may progress in one of two ways: (1) The thrombus may spread rapidly through deep venous channels to the groin giving rise to obstruction with acute symptoms of severe pain and swelling; 90% of cases of femoro-iliac thrombophlebitis begin in this way. Because of deep vein thrombosis chronic swelling of the extremity may be expected. (2) Oschner's phlebothrombosis or quiet thrombosis may develop. There may be a minimum of symptoms until pulmonary embolism occurs. Usually, however, if looked for, tenderness of the calf muscle may be elicited; Homan's sign is positive; there may be slight œdema of the ankle, cyanosis of the foot when standing, and dilatation of the superficial veins. There is a slow propagation of the clot which floats free at its proximal end. The longer the floating clot the greater the likelihood of breaking from its mooring.

Thrombophlebitis is more common after difficult delivery, instrumental delivery, Cæsarean section, in cases where puerperal sepsis is or has been present and in the presence of varicose veins. Therefore, in recommending a treatment it is assumed that the usual prophylactic mea-

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sures, namely, Trendelenburg position, active exercise of limbs while in bed, deep respirations, correction of anæmia and dehydration, and especially early ambulation, will be instituted also in all these cases.

The majority of cases of postpartum thrombophlebitis probably occur from the third to the seventh day following delivery, although definite statistics could not be found. If this is true, then it is felt that if dicoumarol as a prophylactic in the puerperium is indicated, the earlier, following the delivery, that the patient is given adequate dicoumarol, the safer it will be for the patient. Our experience has been that the administration of the initial dose of dicoumarol at the onset of labour does not produce the complication generally expected of this drug, namely, the possible increase in loss of blood.

Since embolus follows on thrombosis it is obvious that anticoagulation must be obtained as soon as possible, preferably before any thrombosis has occurred. We would suggest that an anticoagulant ought to be given at once when there is any sign of venous thrombosis and also when an embolus occurs. This is an attempt to prevent further venous thrombosis and pulmonary embolism and to lessen the possibility of resultant chronic venous insufficiency in the leg. We would go farther than this to recommend that it should be routinely administered, barring a definite contraindication, when there is a history of previous thrombosis or embolism, because of the increased probability of further venous thrombosis or embolism; especially when there is a toxic condition during pregnancy, or when there is any severe trauma or infection during labour.

Dicoumarol, as a prophylactic and therapeutic agent, is superior in all ways but one to heparin. Dicoumarol requires 24 to 48 hours to exert its effect; therefore, there is a lag in obtaining the desired result. Conversely, heparin, which exerts its effect almost immediately, has an advantage over dicoumarol when embolism occurs suddenly. We have been content to use heparin only during the lag period of dicoumarol in the presence of an embolus. In all other instances, because of heparin's cost, we have used dicoumarol. Treatment formerly consisted of the recognized conservative measures plus dicoumarol, all being started as soon as possible after the onset of a venous complication. However, our chief object has been to ward off thrombosis and embolism so that we have administered dicoumarol earlier than has been done elsewhere. It must be understood, however, that we have most rigidly adhered to the routine of giving dicoumarol as outlined repeatedly by Allen, *et al.* of the Mayo Clinic. This routine is of such importance that we refer you to their works rather than discuss it briefly here.

The problem presented by a 31-year old woman aroused our interest as to the possibility of preventing venous complications in the immediate postpartum period. This patient had thrombophlebitis with basal pulmonary infarct at six months' gestation in her previous pregnancy. She was delivered at term and had pelvic thrombophlebitis in the immediate postpartum period, throughout the interpartum period the legs were swollen along with soreness of the veins. During the present pregnancy she suddenly, at three months' gestation, developed acute thrombophlebitis accompanied by bilateral basal infarction of lungs. Her condition was such that operative procedures were considered ill-advised. Dicoumarol and heparin were administered with good results. Two months later there was an acute flare-up in the veins of the same leg. She was hospitalized, given heparin and dicoumarol and both saphenous veins ligated. There was no subsequent œdema but the veins remained tender. As the patient approached term we felt radical measures were indicated to prevent any further complications. Consequently at the onset of labour she was given 300 mgm. of dicoumarol. Labour was short and relatively easy. The following day 200 mgm. of dicoumarol were given and an adequate dosage was maintained for 10 days. There was no abnormal postpartum bleeding either immediate or delayed. She was allowed up on the first postpartum day. There was no morbidity and very little discomfort in the leg, permitting discharge from hospital in the 9th postpartum day.

One of us (C.J.) was presented with the problem of treating two patients, each of whom had developed pulmonary emboli within 24 hours postoperatively. One had had a therapeutic abortion at a time when the veins in the left calf were tender. The other had had an abdominal hysterectomy with no apparent venous complication.

These cases prompted us to enquire concerning the experience of others regarding the safety of early administration of anticoagulants. Dr. Kvale, of the Mayo Clinic, encouraged us to continue giving dicoumarol, when indicated. We were also encouraged by the conclusions of Barnes and Ervin. They reported that in normal pregnant patients given 300 mgm. of dicoumarol during labour and 200 mgm. each day of the first two days postpartum, a determination of blood loss showed no significant difference between controls and the patients given dicoumarol. Also there was no relation between the amount of blood loss and the prothrombin values. Furthermore, an observation by Dr. Segard, Director, Wisconsin Medical Research Foundation, that dicoumarol had no effect on the amount of menstrual flow, seemed sufficient justification to become more radical in the administration of dicoumarol.

The case of a young woman para. 0 grav. ii, who developed an acute thrombophlebitis of the left superficial saphenous vein in the upper two-thirds of the thigh at 36 weeks was instructive. She was immediately admitted to hospital and, along with conservative treatment, was given dicoumarol. The signs and symptoms of thrombophlebitis having entirely cleared within seven days, the patient was allowed up and on the 9th day was allowed home, her prothrombin level being 34 seconds (the normal being 18 to 20 seconds). She was given dicoumarol and instructed that two days later she was to take another 200 mgm. This she did and one hour later, membranes ruptured spontaneously, labour began and the patient returned to hospital. She had a fairly rapid labour, being delivered by low forceps with no abnormal bleeding. She was allowed up on the first postpartum day. Her legs felt normal and they have not given her any trouble since; no tenderness, no swelling and no soreness of veins or discoloration.

A young woman 34 years of age, para. i, grav. iii, presented an interesting complication. During the first pregnancy she was forced to wear elastic stockings due to marked varicosities. Throughout the present pregnancy she did not wear these stockings, although she had been instructed to do so. At approximately 8½ months she developed acute thrombophlebitis of the upper and middle third of the thigh down to the knee with extension across the anterior aspect of the upper leg. She was immediately admitted to hospital, put on complete bed rest, continuous heat, sedation, with elevation of the foot of the bed and dicoumarol was started. Three days later all signs and symptoms of the thrombophlebitis had disappeared, but the patient was kept on dicoumarol. The 11th day in hospital she was given 200 mgm. of dicoumarol, prothrombin level being 30 seconds. The following morning the left saphenous vein was ligated. Twelve hours later membranes ruptured spontaneously, patient went into labour and after 6½ hours she was delivered by low forceps. She had a retained placenta which had to be removed manually. Throughout this procedure and the postpartum course there was no abnormal bleeding. On the second day, while the patient was still receiving dicoumarol, the right saphenous vein was ligated. On her fourth day she was allowed up and discharged from hospital on the ninth day. This patient was seen some few weeks later, at which time she claimed there was no discomfort in the leg whatsoever. On examination the veins were not swollen, nor tender, nor was there any evidence of œdema.

These two cases, though delivered while receiving adequate dicoumarol, exhibited no evidence of any abnormal postpartum bleeding, nor evidence of further venous complication.

Considering the report of Barnes and Ervin and the observations of Kvale and Segard, as previously quoted, together with our own experience, we discussed the advantages to be gained from administration of dicoumarol before venous complications arose. We decided to become more radical. Now, when the indications mentioned above are present, we do not hesitate to give 300 mgm. dicoumarol with the first labour pain and continue adequate dosage from then on for at least 10 days postpartum. We have, in fact, had several patients receiving adequate dicourmarol for an acute thrombophlebitis when labour began. Operations, such as curettage, Cæsarean section and manual removal of retained placenta, have been done with the patient similarly treated with dicoumarol. In none has abnormal bleeding or any other complication attributable to dicoumarol been observed.

Fifteen patients have been delivered to whom dicoumarol had been given at the onset of

labour, or who had received adequate amounts of dicoumarol at time of delivery. We propose to indicate the complications of six representative patients and your attention is drawn to the question marks which each has presented.

CASE 1

A woman, aged 33, para. iii, grav. iv. History of marked varicosities in both legs with occasional mild attacks of thrombophlebitis for a period of five years. She wore elastic stockings during the two preceding pregnancies as well as the present one. Ligation of veins was advised but patient refused. She was delivered of twin boys after 12 hours of labour.

What were her chances of thrombophlebitis or even emboli following delivery? Should the multiple pregnancy influence treatment? We felt the possibilities of venous complications were sufficient to justify immediate administration of dicoumarol on admission to hospital in labour.

CASE 2

A woman, aged 31, para. i, grav. ii. History of marked varicosities of vagina and vulva since first pregnancy three years ago. She had to travel 27 miles to hospital after onset of labour. She was delivered by low forceps one-half hour after admission, a total of three hours' labour.

This patient presented the picture of possible increased risk due to traumatic injury to blood vessels of the pelvis where there was the combination of varicosities of vagina with rapid descent of the fetal head aggravated by a rapid, fairly long drive to hospital.

CASE 3

Patient, aged 34, para. ii, grav. iii. History of discomfort in legs due to varicosities following first pregnancy, four and one-half years ago. During second pregnancy three years ago she wore elastic stockings but was quite uncomfortable. One year later she had veins injected. Labour began spontaneously and she was delivered after three and one-half hours by low forceps.

When varicosities, though previously injected, return during pregnancy, should they be ligated or would dicoumarol at onset of labour be adequate treatment?

CASE 4

Patient, aged 24, para. ii, grav. iii. History of acute thrombophlebitis of left leg on 10th postpartum day with previous pregnancy eleven months ago. During present pregnancy leg was swollen and uncomfortable. After eleven hours in labour she was delivered by transverse cervical Cæsarean section on account of shoulder presentation.

Should this patient—with a definite history of previous postpartum thrombophlebitis with a swollen, uncomfortable leg—have vein ligation during the antenatal period? Would she have a recurrence of thrombophlebitis? She had a Cæsarean section 11 hours after administration of dicoumarol yet no evidence of any abnormal bleeding.

CASE 5

Patient, aged 37, para. i, grav. ii. History of varicosities during first pregnancy. In the present pregnancy she had thrombophlebitis of the right leg at 6½ months. She was admitted to hospital, given dicoumarol and the right saphenous vein ligated. Re-admitted at 8½ months with pre-eclampsia. Following four days of conservative treatment without definite improvement labour was induced medically. Dicoumarol was administered just prior to the initiation of the medical induction. Labour lasted 3¾ hours and she was delivered by low forceps.

Our problem here was a history of varicosities. Acute thrombophlebitis with vein ligation during the present pregnancy with moderately severe pre-eclampsia which did not respond to conservative treatment. Should she receive dicoumarol during treatment for pre-eclampsia or at onset of labour?

CASE 6

Patient, aged 39, para. ii, grav. iii. History of postpartum thrombophlebitis appearing second postpartum day with previous pregnancy 4 years ago. At six months of the present pregnancy she developed acute thrombophlebitis of the left leg. She was hospitalized and given adequate dicoumarol. Following subsidence of signs and symptoms, bilateral ligation was performed. She had a return of thrombophlebitis at 8½ months. Dicoumarol therapy was started at home, her prothrombin level being known, and on the evening of the second day she was admitted to hospital. When adequate amounts of dicoumarol had been given, a medical induction was started. The response was rapid and the patient delivered seven hours later by manual rotation of a persistent posterior followed by low forceps.

Our problem was to protect this patient from further complications immediately before labour, intrapartum and immediate postpartum period. Due to domestic conditions immediate hospitalization was impossible so treatment was initiated at home.

Each was allowed up on her first postpartum day and discharged from hospital not later than the 9th day. There was no evidence of any abnormal bleeding either at the time of delivery or during the puerperium. There were no signs or symptoms of any further venous complications. All patients, except one, have been checked post-natally at approximately six weeks, and give a history of either very slight discomfort or no discomfort of the involved leg, and no cases of swelling or œdema.

DISCUSSION

It is hoped that the facts just presented will be sufficient to arouse the interest of those who are concerned with trying to prevent patients

from suffering the sequelæ of venous complications of pregnancy and that they will also investigate this form of treatment and mode of administration. As a result of our studies we are convinced that the results from anticoagulation therapy are dramatic in the prevention and treatment of venous thrombosis and embolism. We agree with those workers who feel these conditions are almost entirely preventable.

We do not, for instance, yet know whether all pregnant women obviously facing labour with a thrombophlebitis should have prophylactic venous ligation. It seems to us that this procedure has carried those cases, in which we have had it performed, much more comfortably throughout their pregnancy as well as obliterating a large area from which an embolus might arise. We have not, however, had this procedure done primarily to help prevent embolus but rather as a direct therapeutic measure for their varicose veins. We are concerned when a patient has thrombosis about the 8th month (or at any stage in pregnancy) whether or not they should be given dicoumarol from then until they are up and about following their delivery. True this is most inconvenient but still thrombophlebitis and embolism is all this as well and is often fatal.

It is our belief that any patient who during the gestation period, demonstrates acute phlebothrombosis or thrombophlebitis, should be hospitalized and treated by anticoagulant therapy, *i.e.*, dicoumarol; that such a patient, as well as any pregnant patient who has or has had a history of venous disease, may with safety be given 300 mgm. of dicoumarol immediately following onset of labour and that they should be given dicoumarol for at least ten days following delivery. We are so convinced of its value that any patient who has had a venous complication during her pregnancy, and presents no contraindication to its use, is given 300 mgm. of dicoumarol to take home with her. When we are called at the onset of labour she is advised to take this dose before leaving for the hospital.

CONCLUSIONS

1. Fifteen patients have been delivered, to whom dicoumarol had been administered at the onset of labour or who received adequate quantities of dicoumarol at the time labour commenced.

2. Dicoumarol, properly administered, can be safely used antepartum, during labour, or postpartum.

3. There is no increase in immediate or delayed bleeding from the pregnant uterus due to the use of dicoumarol.

4. Dicoumarol will probably decrease the incidence of pulmonary emboli in pregnant women with venous disease.

5. The proper use of dicoumarol will markedly decrease the number of women with painful, swollen legs arising from venous complications of pregnancy.

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Medical Arts Bldg.

ANTICOAGULANT THERAPY*

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WE are concerned about what to do in the way of anticoagulation when a patient, a candidate for surgery or childbirth, has or has had venous thrombosis, with or without embolism. We have concluded, after using heparin for eight years and dicoumarol for six, that these drugs properly administered will prevent venous thrombosis in all but the rare case. Further, we feel that anticoagulation limits the thrombosis if already present and in some way hastens its disappearance. One accomplishes, therefore, prevention of embolism and reduction of morbidity from the thrombotic process itself.

Since there is not yet any established laboratory test to warn of a venous thrombosis, our major problem today is to determine who and when we shall anticoagulate.

This presentation is limited to anticoagulation therapy, but a word is justified at this point on venous ligation. This has its definite merits I think in the therapeutic field, for anticoagula-

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tion does not improve varicose veins; it does not protect these from future phlebitis; and it does not protect the patient from a free-floating thrombus which is already present. Ligation in certain cases, therefore, is a valuable complement to anticoagulation, and we use it freely. However, I would rarely like to rely on ligation alone without anticoagulation in any case.

It is not necessary to detail here the fundamentals of anticoagulation therapy, but our routine must be recorded. Heparin is used only to obtain immediate anticoagulation and is discontinued when and if we achieve dicoumarolization. Until a more satisfactory menstruum for delayed absorption is available, we continue to use heparin in 50 mgm. doses intravenously every four hours, and with this routine it has not been found necessary to do bleeding and clotting times routinely.

Dicoumarol in 100 mgm. tablets or capsules is administered by mouth, exactly according to the routine originally described by Allen, Barker, *et al.*, of the Mayo Clinic, in 1942. We give 300 mgm., occasionally 400, the first day, after a normal prothrombin time is obtained, and then sufficient to maintain the prothrombin time between 34 and 37 seconds.

We continue to use the modified Quick test for prothrombin time estimation and have obtained the thromboplastin for many years from one company without a complaint. We have found variation in prothrombin time for different individuals but not for different batches of thromboplastin. Here I must stress that we have had one technician, Mr. Harold Amy, working with us in the Army and in Hamilton General Hospital since 1942, and there are less than 6 technical errors observed in that time. Without such accuracy in prothrombin estimation, we would not have such optimistic results to report. With such co-operation we would classify dicoumarol as a safe drug, contrary to the other view expressed so often in the literature.

With this as a background then, we began to feel about three years ago that these drugs, particularly dicoumarol, might be safe enough to use earlier in the postoperative or postpartum state. We were worried about the person with a history or signs of thrombosis or embolism who was a candidate for operation or childbirth. We were, and still are, told that if a patient is adequately dicoumarolized, there is a grave risk of unusual bleeding at operation or labour. Actually, this warning was based on surmise rather than on experience and we were encouraged by workers at the Mayo Clinic to experiment. Further, contrary to the views of some, a fair number of emboli occur within 48 hours of surgery or delivery, and we have seen such occur in 7 cases. Particularly would one expect this event if it had occurred at such a time after a previous operation or delivery, or if a patient entered the operating room with varicose veins or phlebitis. During the past 3 years, therefore, we have not hesitated to administer dicoumarol prophylactically, preoperatively or prepartum, to individuals with a warning sign or history. During this period we also considered the case of the cardiac infarct for early anticoagulation because here the disease entity itself spells embolism for a not insignificant number.

The results in these 3 groups, the cardiac, the operative, and the pregnant, will be discussed separately.

Cardiac infarction.—Our series is small; it is not a well-controlled experiment, and post mortem evidence is deficient. Only those cases seen within the first 5 days who would go to and stay at hospital for 4 weeks were dicoumarolized. However, the results are perhaps significant. A total of 92 cases is considered; 35 were public ward; 24 of these had no dicoumarol with 10 deaths and two more had pulmonary embolism; 11 of the 35 had dicoumarol, with 1 death and 1 pulmonary embolus. (This embolism occurred before dicoumarol had taken effect.) There were 57 private cases; 35 had no dicoumarol with 8 deaths and 5 more had embolism (3 pulmonary and 2 peripheral); 22 of the 57 had dicoumarol, with 2 deaths and 1 pulmonary embolus. (This embolism occurred 4 weeks after the patient went home from hospital after an osteopath manipulated a leg which the next day showed a saphenous phlebitis.)

It seems hardly fair and too honest to include these 2 cases of embolism in the dicoumarolized group, but even if we do, there were by percentage 3 times as many deaths and almost 3 times as many emboli in that group which was not dicoumarolized.

The surgical group. — Because of venous thrombosis at the time for operation, we have

preoperatively dicoumarolized a number and had them operated on with a prothrombin time between 30 and 40 seconds. There have been 8 hysterectomies, 2 dilatation and curettage of the uterus, 3 prostatectomies (1 suprapubic), and 3 abdominal laparotomies in this group. In none was there excessive bleeding; no embolism occurred; and each patient's phlebitis was cured after a normal postoperative stay in hospital. It is of interest that 2 prostatectomies and 1 hysterectomy were considered for preoperative dicoumarol administration. When they bled profusely postoperatively, the surgeons were chagrined to learn that no dicoumarol had been given. One wonders if the anticoagulant is thus often wrongly blamed in other cases reported in the literature.

The obstetrical group.—We have already described our experiences (see preceding paper) with 15 patients. We would now like to report that our series has increased to 90 patients who received dicoumarol prophylactically or therapeutically at an earlier stage in labour than is done by other workers. Included are 3 delivered by Cæsarean section and 2 whose retained placentæ were manually removed; these 5 were fully dicoumarolized at the time of delivery. A few in this series with no warning sign or history developed phlebitis within a few days post-partum, so anticoagulants to these were first exhibited at this time. The bulk of this series, however, had phlebitis or a history of phlebitis and/or embolism at the time of labour. Where a thrombotic process was present, the patient was dicoumarolized ante-partum and was delivered with the prothrombin time carefully maintained by the internist between 34 and 40 seconds. If there was a history only, of previous phlebitis or pulmonary embolism, or if we had treated and apparently cured her of such, earlier in that pregnancy, then the following was our routine.

The patient was given 300 mgm. dicoumarol to take home with her. When she phoned her obstetrician to say labour had commenced, he told her to swallow the 3 capsules and go at once to hospital. On admission, a prothrombin time is done and the internist takes over anticoagulation for the duration. If the prothrombin time is normal, and so far it has always been, then another 200 mgm. is administered in 12 to 24 hours.

We cannot prove conclusively as yet, but feel that 400 mgm. as the first dose, and 100 mgm. 12 to 24 hours later, will get the prothrombin time up faster and as safely as the 300 - 200 routine. There are a few little tricks in dicoumarolization which there is not time to discuss, but one is worth mentioning. One knows that there is individual variation in the amount of dicoumarol required and if you have occasion to dicoumarolize a second time a healthy woman in pregnancy, you may achieve faster and better results if you look up her previous reaction to this drug. Usually, one who needs 700 mgm. to get a prothrombin time of 35 seconds, will be better given an initial dose of 400 mgm., and one whose prothrombin time shot up to over 40 seconds with 500 mgm. will be better given a single dose of 300 mgm., or even 200 mgm.

We have, in this series of 90, no case of abnormal intrapartum, immediate or delayed post-partum bleeding. In none has embolism occurred. The effect on existing phlebitis has been dramatic. No longer are these women disabled for many weeks or months; the average stay in hospital for this group is only 2 to 3 days longer than the uncomplicated pregnancy which is kept for 8 days. We maintain dicoumarolization for approximately 14 days post-partum but due to the prolonged action of the drug we can usually administer the last dose on the 10th to 11th day post-partum and discharge the patient then.

Are we justified in such radical dicoumarolization to prevent early postoperative or post-partum embolism? Here are a few examples from our experience that makes us think we are. We have seen 2 postpartums with pulmonary embolus within 24 hours of delivery. Another, a toxæmia of pregnancy at six months with a tender calf vein, got a pulmonary embolus 18 hours post-hysterotomy. A prostatectomy had a pulmonary embolus 3 days postoperative. The sorriest case of all was a woman who had varicose veins with phlebitis, had these ligated, and was dicoumarolized pre-partum. She delivered normally a healthy baby, went home in 10 days, had no trouble with her legs, but promptly got a prolapse of her uterus. This was surgically removed three months later without dicoumarol, due to an oversight, and she was got out of bed on the first postoperative day. On the tenth post-operative day, while packing her bag to go home, she had a pulmonary embolus and died within 20 minutes. It seems to me that only

one of these in a lifetime will justify the labour in countless others.

SUMMARY

During the past 8 years, we have had no fatality from the use of heparin and no dangerous bleeding. In a few early postoperatives, we have seen unusual bleeding and all were controlled by the usual medical coagulant measures. During 6 years, we have had no fatality as a result of dicoumarol and no unusual much less dangerous bleeding has been seen when it was properly administered. This statement must be enlarged upon for we have certainly seen people bleed because of a too reduced prothrombin content. This has occurred, in our experience, only when the dose of dicoumarol was excessive, and the prothrombin time greater than 40 seconds; excessive because the patient had access to the drug and took more than was ordered (3 cases), or because the doctor had not followed the routine of waiting for a prothrombin time before giving the initial or daily dose. However, to repeat, in no case in our series, which includes all in whom we have initiated dicoumarol therapy, have we had a recognized serious complication, nor have we had to discontinue dicoumarol for any reason.

We are fortunate, according to some reports, but, without exception, embolism has not occurred in any heparinized or fully dicoumarolized patient under our care.

CONCLUSIONS

1. Anticoagulation is an essential in the treatment of cardiac infarction, and in cases of venous thrombosis.

2. If operation is imperative, or delivery impending, a patient with venous thrombosis should be dicoumarolized at once.

3. If there is a history of venous thrombosis or embolism, anticoagulation should be initiated during or immediately after operation or delivery.

4. Earlier anticoagulation is not only safe but effectively reduces morbidity and mortality from thrombo-embolic disease in the surgical and obstetrical patient.

Special thanks are due Dr. D. L. Adamson for his close co-operation and help with the obstetrical patients referred to above. This work on the obstetrical patients was done with the permission and co-operation of Dr. R. T. Weaver, Chief of Obstetrics and Gynæcology, Hamilton General Hospital.

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AMŒBIASIS IN VETERANS*

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AMŒBIASIS is an uncommon disease in Canada, but one which has caused considerable controversy attributable to two factors: the difficulty of producing convincing evidence that the parasite isolated from a patient is actually *Entamœba histolytica;* and the difficulty of determining whether the parasite, even though unquestionably *E. histolytica,* is producing a pathological process responsible for the patient's symptoms. Although recent surveys[1, 2, 3, 4] of small groups of Canadians have shown that 1 to 2% of those examined harboured the parasite, the rarity of clinical recognition of the disease in large general hospitals and the equal rarity of the finding of amœbic colitis or amœbic liver abscess in routine post mortem examinations indicate that very few Canadians suffer from amœbic infection.

During the recent war, however, Canadian service men and women were transported to areas where the disease is endemic. Others, in prison camps and field units, came in contact with individuals from such areas under conditions where adequate sanitation was wanting. In these circumstances it was to be expected that some would acquire amœbic infection. Experience in Italy during the latter part of the war indicated that the usual duration of symptoms prior to recognition and treatment of amœbic infection was from six to twelve months. It was reasonable to suppose, then, that individuals would return to Canada with the disease unrecognized and untreated. During the early post-war period, patients were seen at the D.V.A. hospitals in Toronto who had *E. histolytica* demonstrated in the stools; some of these patients were seriously ill; some had mild bowel symptoms; others had no symptoms of gastro-intestinal disease. It was decided, therefore, to investigate this problem with a view to studying clinical manifestations of amœbic infection in Canadian veterans.

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In order to fully appreciate the nature of amœbic infection, some reference to the development of present knowledge of the disease is necessary. In 1875, Losch described, under the name of *Amœba coli,* an amœba present in the stools of a young Russian peasant who suffered from persistently relapsing dysentery. This amœba was certainly that which is now known as *E. histolytica,* the change in name being due to the reclassification of the intestinal amœbæ of man by Schaudinn in 1903.

Koch, Kartulis, Osler, Councilman and Lafleur, Quincke and Roos, and Haber contributed further to our knowledge of the parasite and the pathological processes which it can produce. In 1913, when Walker and Sellards[5, 6, 7] published the results of their studies in the Philippines, knowledge of this infection was virtually as complete as it is today. They fully described the parasite, its life cycle and its differentiation from *E. coli* and were the first to indicate the nature and importance of the "carrier" state. Since their view is widely held at the present time, it is worthy of further consideration. Their observations in the Philippines and their study of experimental infections in volunteers indicated that few of those infected developed symptoms. On the other hand, experimental infections in kittens revealed the fact that, whenever the animal continued to harbour the parasite, a pathological lesion of the bowel could be demonstrated. Therefore, they postulated that the usual symptomless infection of man is associated with a lesion of the bowel, but one where the destructive effects of the parasite are balanced by the reparative powers of the host and, thus, host and parasite live in a state of equilibrium.

The state of equilibrium of the carrier may be disturbed at any time by factors which are largely unknown but which apparently are more prevalent in tropical and subtropical areas than in temperate zones. Such disturbance of the state of equilibrium results in a pathological process which adversely affects both host and parasite. In the host this is manifest by: (1) disturbance of large bowel function, varying in degree from mild symptoms of irritable colon to frank dysentery; (2) systemic manifestations of varying degree; (3) symptoms and signs due to the invasion of tissues distant from the gut—notably, liver; less commonly, lung; and rarely, brain. The parasite is adversely affected in that encystation occurs only in the lumen of the colon and migration to distant tissues or diarrhœa, which does not allow time for encystation, means ultimate death for the amœbæ and prevents their perpetuation.

Most writers believe that human infection persists indefinitely if untreated, and that *E. histolytica* is always a true tissue parasite. Wenyon[8, 9] has questioned both these hypotheses. He observed that his own symptomless infection, acquired during World War I, died out in four years without specific treatment. He also points out that the "precystic" phase of the parasite, which never contains ingested red blood cells, may possibly live in the lumen of the gut as a saprophyte. The successful culture of the parasite on artificial egg media by Boeck and Drbohlav, in 1925, lends support to such a view.

It is apparent then that two primary problems presented themselves for study in Canadian veterans. In the first place, the parasite must be identified with certainty as *E. histolytica*; and, secondly, it must be determined, if possible, whether the parasite was producing a pathological process. Since the identification of the vegetative stage of the parasite, with its progressive motility and ingested red blood cells, is more certain than the identification of the cyst, an effort was made to demonstrate the trophozoites in all cases. Experience with the disease in Italy had already made clear the fact that extensive disease of the colon could exist without involvement of that part of the bowel which can be viewed with the sigmoidoscope or without giving rise to changes detectable by roentgenography. It was decided, therefore, that careful gross and microscopic examination of the fæces offered the most hopeful source of information, and every effort was made by this method to detect evidence of ulceration of the colon. In the survey of suspected patients, normal stools were examined on two successive days, both by direct smear and after zinc sulphate flotation to concentrate cysts; on the third day, a saline purgative was given and the first three stools were examined on a warm stage; the first stool passed on the fourth day was similarly examined.

In all, 1,457 veterans were examined between May, 1946, and March, 1948: 258 of these were found to harbour *E. histolytica.* This group was made up of patients who presented symptoms suggestive of amœbiasis, returned prisoners-

of-war and veterans who had served in areas where amœbiasis is endemic but who were in hospital because of illness not related to the gastro-intestinal tract. The stool findings are summarized in Table I. It is apparent that in

TABLE I.
STOOL FINDINGS IN 258 POSITIVE CASES OF AMŒBIASIS (D.V.A., TORONTO)

Trophozoites with red blood cells	173	(67%)
Trophozoites without red blood cells	32	(12%)
Complete examination	12	
Incomplete examination	20	
Cysts only	53	(21%)
Complete examination	8	
Incomplete examination	45	

67% of these cases trophozoites with free and ingested red blood cells were present: there is clear evidence that in these *E. histolytica* was a true tissue parasite producing ulceration of the colon. While in some who were examined during a phase of diarrhœa the trophozoites were easily found, others who were not exhibiting diarrhœa at the time of examination had only cysts in their formed stools. In such cases saline purgation, alcohol or, occasionally, a provocative dose of emetine hydrochloride were resorted to before the trophozoites with ingested red blood cells were demonstrated. In 65 of the 85 cases where trophozoites with ingested red blood cells were not demonstrated the routine examination, as outlined, was not carried to completion. On the other hand, in 84 consecutive cases, where circumstances allowed, special care was taken to see that the examination was complete and, in these, trophozoites with free and ingested red blood cells were demonstrated in 78, or 93% of the cases.

Of the 258 positive cases 223 were treated in D.V.A. hospitals in Toronto and their records were available for analysis. On the basis of clinical findings, these cases are classified as in Table II. In nearly all cases a history of

TABLE II.
CLINICAL CLASSIFICATION OF 223 CASES OF AMŒBIASIS TREATED AT D.V.A. HOSPITALS, TORONTO MAY, 1946, TO MARCH, 1948

Symptoms	*Colonic cases*	*Colonic and hepatic cases*	*Total cases*
Dysentery*	5	0	5
Diarrhœa	72	9	81
Irritable colon	32	9	41
No gastro-intestinal symptoms	91	5	96
	200	23	223

* Gross blood and mucus in stools.

dysentery or diarrhœa during service was obtained. It is apparent that dysentery was rare in the group as observed in Canada. Seventy-two patients presented with chronic or persistently and frequently recurring diarrhœa without gross blood or mucus in the stools. These patients usually complained of associated crampy lower abdominal pain, often of pain in the cæcal area, and sometimes of upper abdominal distress and flatulence. In 32 cases the symptoms of minor irregularity of bowel function, mild crampy lower abdominal pain, pain in the right lower quadrant of the abdomen, sometimes associated with flatulence and vague upper abdominal distress, presented a picture indistinguishable from that of irritable colon of any cause, organic or functional. Ninety-one patients without gastro-intestinal symptoms were discovered during routine examination of returned prisoners-of-war and patients who had served in areas where the disease was endemic and were in hospital for other reasons; many of these, however, had ulceration in the colon, as indicated by the demonstration of trophozoites with free and ingested red blod cells.

Evidence of systemic disturbance was exhibited in a considerable number of patients in whom the disease was limited to the colon. Low grade fever was frequently but by no means invariably found and, as many were being treated as out-patients, a close observation of temperature was not possible. Fatigue, loss of energy, depression, irritability and vasomotor disturbances were present singly or in combination in many of these patients. Such symptoms are commonly found in patients with chronic infection of any kind, but are also found in psychoneurotic states. In a group of veterans where readjustment to civil life with its problems of family relations, employment, housing, etc., frequently provided grounds for anxiety, it has proved impossible to assess such symptoms accurately in all cases.

Evidence of involvement of the liver was found in 23 cases and active disease of the colon was demonstrable in 18 of these, as shown in Table II. In most cases the disease was chronic. Fever was low grade or absent. Fatigue, loss of weight and pain in the liver area, associated with enlargement and tenderness of the liver—particularly the right lobe—were found in all. Many also complained of irritability and mental depression. In none

was evidence of disturbed function of the hepatic parenchyma apparent. In a few cases the disease was acute. The temperature chart of one such patient is shown in Fig. 1.

S.T., aged 22, was admitted to Christie St. Hospital, Toronto, on May 5, 1946, with a chief complaint of chills and fever of three months' duration. He had served as an air-crew officer with the R.C.A.F. in Canada, West Indies, the United Kingdom and in India for five months in 1945. He returned to Canada in good health. With the exception of a brief but violent attack of nausea, vomiting and diarrhœa lasting twelve hours, which occurred en route home from India, he gave no history of gastro-intestinal symptoms prior to the present illness.

Three months before admission to hospital the patient noted the onset of irregular bouts of chilliness, malaise and fatigue. At the same time he noted vague upper abdominal discomfort, more severe after meals. The upper abdominal distress increased to the point of moderate pain and localized in the right upper quadrant. The bouts of chilliness became more severe and more frequent until they occurred nightly and were associated with drenching sweats. He lost twenty pounds in weight.

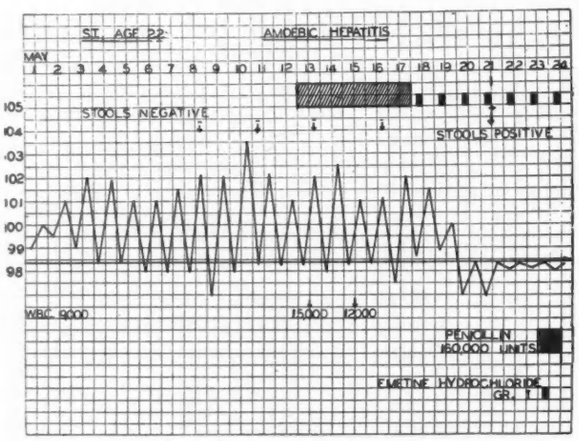

Fig. 1.—Effect of emetine hydrochloride on acute amœbic hepatitis.

On admission, he appeared pale, thin and ill. The liver edge was palpable one inch below the costal margin in the right midclavicular line. The chest was clear and the diaphragm moved freely. These findings were confirmed by fluoroscopy and x-ray plates of the chest. The remainder of the physical examination was not remarkable. Blood cultures, agglutination tests for typhoid, paratyphoid A and B, and *Brucella abortus* were negative. Repeated stool examinations for *E. histolytica* were negative. Other significant laboratory findings and temperature chart are shown in Fig. 1.

The patient's course in hospital was one of recurring chills, fever and drenching sweats, with persistence of pain in the right upper quadrant. The liver did not change in size but did become a little tender. Treatment with penicillin—160,000 units intramuscularly, daily—produced no improvement.

On May 18, a course of intramuscular emetine hydrochloride was begun. Rapid improvement followed, as evidenced by decrease in fever and pain and improvement in the patient's sense of well-being. He went on to uninterrupted recovery. The liver edge receded to the costal margin. He was followed for eighteen months and remained well.

Three days after the first dose of emetine hydrochloride, *E. histolytica* trophozoites with ingested red cells were demonstrated in the stools.

Diagnosis: Acute amœbic hepatitis.

E. histolytica was demonstrated in the stools of patients who also had other disease. In three patients the clinical histories, cytological findings in the stools and the course of the disease all indicated a diagnosis of idiopathic ulcerative colitis. Elimination of the parasite did not alter the course of the disease. Two other patients had carcinoma of the colon. Others undoubtedly had functional disorders of the colon which probably antedated the amœbic infection and persisted after its successful treatment.

TABLE III.
TREATMENT OF AMŒBIC COLITIS: THREE METHODS

Method	*Cases*
(*a*) Emetine hydrochloride, gr. i, intramuscularly, daily for 7 days, emetine-bismuth-iodide, gr. iii, daily for 12 days, chiniofon 2% (yatren) enema daily, concurrent with emetine-bismuth-iodide	36
(*b*) Emetine hydrochloride, gr. vii, as in (*a*), followed by diodoquin, 9.6 grains, three times a day, for a total of 640 grains	116
(*c*) Diodoquin, as in (*b*), alone	71

The three methods used in the treatment of amœbic colitis are summarized in Table III. In all cases of amœbic hepatitis, emetine hydrochloride, 1 grain daily, was given intramuscularly for seven to ten days and followed by either emetine-bismuth-iodide or diodoquin.

Such treatment resulted in the elimination of the parasite in the great majority of cases. Follow-up consisted in the examination of two formed stools and, where there existed any suspicion of recurrence either from this examination or the patient's symptoms, stools were again examined after saline purgation. Such examination was done at one, three and six months after completion of treatment and thereafter every six months except when the patient failed to return. The results are summarized in Table IV.

TABLE IV.
STOOL EXAMINATIONS FOLLOWING TREATMENT OF 223 PROVED CASES OF AMŒBIASIS

Time after completion of treatment	*Cases*	*Stools positive*
Months	*No.*	*No.*
Not examined	14	
1	209	2
3	164	0
6	141	1
9	103	0
12	77	2
18	26	0
24	11	0

Of the five patients whose infection recurred, one had been treated with diodoquin alone, two with emetine hydrochloride and diodoquin, one with emetine hydrochloride, emetine-bismuth-iodide and chiniofon enemata, and one with emetine hydrochloride, emetine-bismuth-iodide, chiniofon enemata, carbarsone, diodoquin and penicillin. The last mentioned patient presented a particular problem. He had been treated repeatedly since 1942, when his infection was recognized in India, only to have diarrhœa with passage of blood and mucus recur within two or three months. He was found to have a fibrotic lesion with ulceration in the lower rectum. Diodoquin eliminated the parasite from the stools but bleeding and diarrhœa persisted. Scrapings from the lesion revealed *E. histolytica* trophozoites with ingested red blood cells. A further course of treatment with emetine hydrochloride, emetine-bismuth-iodide and chiniofon enemata has been followed by relief of symptoms and negative stools for nine months.

Following treatment, symptoms of colon dysfunction subsided rapidly except for a minor degree of colon irritability which often persisted for two or three months and, occasionally, longer. The response of systemic symptoms was variable. In patients who presented prominent evidence of colon disorder, the accompanying fatigue and other symptoms of chronic infection tended to improve following elimination of the parasite. On the other hand, where evidence of bowel disorder was minimal or absent and systemic symptoms marked, the latter were usually due to other factors and were not improved following treatment of the amœbic infection.

Fifteen of the 23 cases of amœbic hepatitis responded rapidly to treatment. In these the liver returned to normal size, pain subsided and systemic symptoms cleared. In four, recovery was slow and eight to twelve months elapsed before the patients were entirely well. In the remaining four cases, signs and symptoms which may be the result of amœbic hepatitis still persist for one to three years following treatment.

Serious toxic effects of the drugs used were encountered only with emetine hydrochloride. In two cases, pain and electrocardiographic changes suggesting coronary thrombosis developed during or within ten days after a course of intramuscular emetine. Both patients recovered. While it is not certain in either case that the drug was the cause of the cardiac disease, such is indeed a likely possibility. One other patient developed an increase in auricular extra-systoles previously present. Although electrocardiograms were taken routinely before and immediately after emetine hydrochloride therapy, no other cardiac abnormalities were encountered. Aching pain and subjective weakness of the limbs were encountered in a few cases: in these no objective evidence of peripheral neuritis was found.

DISCUSSION

In this group of veterans the demonstration of the vegetative form of the parasite and amœbic ulceration, as indicated by the finding of trophozoites with ingested red blood cells, depended upon the diligence with which they were sought. One may conclude, therefore, that in the majority the parasite was actually producing a lesion in the colon. Such a lesion is compatible with good health and freedom from all symptoms, either local or general. The symptoms of colon disease are not such as to permit an accurate diagnosis, which must depend rather on the demonstration of the causative organism in the stool. The diagnosis should be suspected, however, when symptoms of disturbance of large bowel function, with or without systemic manifestations, are exhibited by a patient who has been in an area where amœbiasis is endemic. Acute amœbic hepatitis should be suspected where symptoms of acute infection are combined with evidence pointing to the liver as the site of the infection and where amœbic infection of the bowel—past or present—is a possibility. Chronic amœbic hepatitis should be suspected in patients who have or have had amœbic colitis and who present symptoms of chronic infection combined with enlargement and tenderness of the liver.

Emetine hydrochloride is the most efficient drug for controlling severe systemic manifestations of amœbic infection and for destroying the parasite in tissues remote from the gut. It is not as efficient as other drugs in eliminating the parasite from the colon. If used, it should always be followed by emetine-bismuth-iodide or diodoquin. Because of its toxicity, it is contraindicated in the treatment of mild infections

limited to the colon. In such cases diodoquin appears to be the drug of choice.

It is apparent that considerable numbers of Canadian veterans harboured the *E. histolytica* on discharge from the services. In view of experience[10, 11] in Great Britain following World War I, where a similar influx of infected individuals was not followed by a large increase of clinical amœbiasis, it is not to be expected that large numbers of our veterans will develop serious manifestations of amœbic infection or that the disease will be widely disseminated through the country. Rather, it is to be expected that occasional veterans will be seen, perhaps for many years hence, who develop amœbic colitis or amœbic hepatitis with or without abscess. The possibility of amœbiasis should, therefore, be borne in mind when evidence of infection of these organs is encountered in veterans of World War II.

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RÉSUMÉ

Les auteurs ont étudié l'action d'*E. histolytica* sur l'organisme chez des vétérans. Plusieurs de ces patients étaient complètement asymptomatiques malgré la présence de parasites dans leurs selles. Walker et Sellards avaient déjà trouvé en 1913 que les infections asymptomatiques étaient expliquées par un équilibre entre l'effet destructeur des parasites et des forces réparatrices de l'hôte. L'apparition des symptômes serait causée par la rupture de cet équilibre. Les auteurs décidèrent d'identifier la forme végétative du parasite plutôt que de rechercher des kystes. Chez 1,457 vétérans avec ou sans symptômes, on retrouva *E. histolytica* dans 258 et 67% de ceux ci révèlèrent des parasites à formes végétatives ce qui signifiait une lésion du colon. On peut penser à l'amibiase chez des patients ayant déjà visité des pays où cette maladie est endémique et présentant des signes de mauvais fonctionnement du colon ou d'infection à point de départ du foie. Trois médicaments furent employés par les auteurs dans le traitement de cette maladie. Le chlorhydrate d'émétine est excellent chez ceux qui présentent des réactions systémiques, mais très efficace pour débarrasser le colon des parasites. On doit donc lui adjoindre d'émétine-bismuth-iode ou le diodoquin. Le chlorhydrate d'émétine est toxique et ne doit pas être employé pour les affections bénignes de l'amibiase.

YVES PREVOST

THE USE OF BCG*

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AS early as 1926, Canadian workers hurried in checking over the work of Calmette and his colleagues[1] on BCG. This was undertaken only two years after their announcement of the results obtained in 217 Parisian children vaccinated with BCG from 1921 to 1924. It is worthwhile mentioning here that the 25th anniversary of this important scientific and medical event is being celebrated in Paris, where the First International Congress on BCG is being held under the combined sponsorship of the Pasteur Institute and the French Government.

THE HISTORY OF BCG VACCINE IN CANADA—RESULTS—VALUE OF BCG

In 1925, the National Research Council of Canada created an Associate Committee for research on tuberculosis and BCG, by which the University of Montreal was entrusted with the work of preparing BCG and studying its innocuousness and effectiveness in laboratory animals and new born children from tuberculous environment. Professor J. A. Baudouin,[2] of the Medical Faculty of the same University was the originator, in 1926, of oral BCG vaccination of new-born in Canada and in America.

Professor A. C. Rankin, of Alberta and Dr. E. A. Watson, of Ottawa, also under the auspices of the National Research Council of Canada, undertook the study of BCG vaccination of the bovines. Contrary to Watson, Rankin[3] has obtained definite protection with BCG in cattle thus confirming the previous works of Calmette, Guérin, Richart and Boissière.[4] Identical results were later published by Buxton, Griffin and coworkers.[5, 6] Starting in 1933, Frappier and his collaborators,[7 to 16] have confirmed the innocuousness of BCG for laboratory animals and humans, and its protective value in the guinea-pig; the same authors have also studied the development and the evolution of the tuberculin hypersensitivity in guinea-pigs and in humans vaccinated with BCG, the value and practicability of new modes of vaccination, the infratuberculin allergy and the stability of BCG vaccine.

In 1933, Dr. R. G. Ferguson,[17, 18] of Saskatchewan, initiated his study of intradermal BCG vaccination of Indian children and, later on, of white adults, nurses and employees of hospitals and sanatoria, found negative to tuberculin. From the beginning, Dr. Ferguson used the BCG vaccine prepared at the University of Montreal. The works of Baudouin and Ferguson are among the most important and conclusive statistical studies ever published on the value of BCG. Their results show that, in tuberculous surroundings, BCG vaccine can afford an appreciable protection against tube[illegible]

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culosis (from 72 to 80%) either in newborn or adults, and that this protection extends over a remarkable period of time, *i.e.*, at least 5 years after vaccination (Tables I and II).

TABLE I.
RESULTS OF PROFESSOR J. A. BAUDOUIN (MONTREAL)
1926 - 1947
TUBERCULOSIS MORTALITY RATE PER 1,000

Groups	*Total number in each group*	*6 to 12 months*	*1 to 4 years*	*5 years and over*	*All ages*
New-born vaccinated with BCG, oral method	1,187	6	12	0	15
Non-vaccinated controls	1,606	21	29	2	49

TABLE II.
RESULTS OF DR. R. G. FERGUSON (SASKATCHEWAN)
1938 - 1946
PERCENTAGE OF MORBIDITY BY TUBERCULOSIS

Groups	*Total number in each group*	*Number of tuberculosis cases*	*% of morbidity by tuberculosis*
Nurses vaccinated with BCG, intradermal method ..	1,005	9	0.895
Hospital personnel vaccinated with BCG	470	9	1.92
Nurses negative to tuberculin not vaccinated (controls)	1,368	55	4.02
Hospital personnel negative to tuberculin not vaccinated (controls)	274	32	11.67

THE BCG VACCINATION SERVICE IN CANADA—AFFILIATED SERVICES—RESEARCH

All the above results, as well as the scrupulous technique employed in the laboratories of the BCG Vaccination Service of the Institute of Microbiology and Hygiene of the University of Montreal, which is delivering BCG throughout Canada, Australia and Newfoundland, have progressively given confidence to physicians, health officers and the public in general in Canada towards BCG vaccination. During the period extending from 1926 to 1948, over 200,000 persons have been BCG vaccinated in Canada, most of them in the Province of Quebec. At the present time, over 20% of the newborn in the Province of Quebec are yearly vaccinated with BCG.

The BCG vaccine is delivered free of charge to subjects to be vaccinated. The BCG Vaccination Service is supported by special grants from the Department of Health of the Province of Quebec which took over, in 1938, the financial assistance till then shared by the National Research Council and the Medical Faculty of the University of Montreal.

Brief mention should be made of the activities of the BCG Clinic of Montreal, under the direction of Dr. Guilbeault, which was established in 1935 by the Provincial Ministry of Health, for the isolation, vaccination and revaccination of children born in tuberculous families. Acknowledgment should be made also of the work accomplished in the obstetrical clinics of the numerous hospitals in the province and especially of that in the Social Service of Ste-Justine Hospital in Montreal, under the direction of Dr. Lapierre, whose collaboration enabled us to study the development of post-vaccinal allergy as well as new modes of vaccination.

We have also studied the various methods of vaccination with Calmette's vaccine at the BCG Clinic of Montreal, in Indian Agencies and in schools supervised by the Health Unit of Verchères. In the latter case, we have performed extensive experiments, with the collaboration of Dr. Roy,[19, 20] on the development of tuberculin allergy along with the local and systematic reactions to vaccination. We have also carried on the same kind of experiments in St-Jean-de-Dieu mental hospital in Montreal.

Most of the vaccinations with BCG in the Province of Quebec were performed by the oral method, consisting of three doses of 10 mgm. of BCG given on alternate days in the first 10 days of life. Very few adults were vaccinated, exception being made for hospitals and sanatorium personnel. On the other hand, Dr. R. G. Ferguson and his associates in Saskatchewan have worked out the intradermal route for vaccination, using 2/10 mgm., divided into 2 injections.

DISCUSSION ON THE VARIOUS METHODS OF VACCINATION—TECHNIQUES

The disadvantages of the oral route are the slow induction of tuberculin allergy (3 to 6 months) and the impossibility of ascertaining whether the vaccine has been successfully absorbed. Vomiting or any cause limiting the absorption by the intestinal tract are hindering factors of efficiency in oral BCG vaccine. The advantages of the oral route are that it is easily accepted and does not produce any local or general reactions except in a few instances,

where moderate enlargement of the cervical glands is noted. No hyperthermia is attributed to oral BCG. In some cases, a mild diarrhœa may follow, which subsides rapidly without any medication.

The disadvantages of the intradermal and subcutaneous methods are the eventual formation of cold abscesses of a degree varying according to the perfection in the technique of injection, as Törnell,[21] and other authors have recently emphasized. When drainage is necessary, these abscesses must not be incised but punctured, in order to avoid scar formation. Nearly 100% of subjects thus vaccinated become tuberculin allergic within two or three months after vaccination.

When testing with tuberculin, our first screening is made with the Vollmer patch test, then the negatives are tested with the Mantoux, using at least 1 mgm. tuberculin O.T., or 5 mgm. P.P.D.

Although the oral route is still in use in most of the clinics of the Province of Quebec, we have introduced the scarification method, proposed by Nègre and Bretey,[22] which is gradually replacing the oral method. The subcutaneous route is not recommended. A few authors still prefer the intradermal method for its easiness and rapidity. They use it for children or adult vaccination, less in newborn, but they have to deal with occasional scar formation, which, in certain regions, may constitute a handicap to the wide acceptance of BCG vaccination. We have made an extensive study of the allergizing value of the multiple puncture or Rosenthal method[23 to 26] and the scarification method, both in newborn and adults. We advocate, for both these methods, the use of an emulsion of vaccine containing 60 mgm. per c.c. Experience has shown us that, in order to obtain a high and durable degree of allergy, 40 to 60 punctures should be performed for the former method of vaccination and, for the latter, 4 to 6 scarifications, newborn receiving the smaller doses. The sites of choice, in either case, are, for children and adults: the lower back in the lumbar region, dividing equally the punctures and the scarifications on each side of the vertebral column; newborn are preferably vaccinated on the upper deltoid region or in the thoraco-axillary space. The reason for recommending the lumbar region is based on the occasional scar formation following the vaccination of an individual already allergic or being in the state of the so-called infratuberculin allergy, which will be discussed briefly later on.

Both techniques of multiple puncture and scarifications are easily performed. BCG vaccination by the method of Rosenthal is similar to the technique used for smallpox vaccination. Bleeding should be avoided, although pin-point hæmorrhages may be noted at the sites of the punctures. As to the method of scarifications scratches of 1 cm. long are made with a needle similar to that used for the puncture method, through drops of BCG spaced 1 cm. one from another. The scratch must be vigorous enough to produce slight bleeding by one single stroke. The oozing, having appeared after a few seconds, is diluted in the vaccine with the point of the needle. Two sterile compresses, moistened with a small quantity of vaccine, are then applied on the scarifications. They are removed the following day.

The allergizing properties of both methods compare favourably, providing one uses sufficient dosage of vaccine and a number of punctures and scarifications which allow equal surfaces of entry. In non-allergic vaccinated individuals, local reactions with both methods offer the same pattern. They are noted two weeks after vaccination and appear as red pin-size or linear cheloid-like nodules; no abscess formation is noted; swelling of local lymph-nodes is very rarely observed.

Experimentally and clinically, it is well proved that the dosage of the vaccine and the multiplication of the portals of entry are of considerable importance in the earliness, the intensity, and the duration of the allergy. We have confirmed the contention of Nègre and Bretey and other authors, in guinea-pigs and in humans, as to the ideal concentration of BCG, which should be at least 60 mgm. per c.c. of emulsion, for performing regularly successful vaccinations by the transcutaneous methods.

The scarification method, no doubt, offers appreciable advantages over other routes of introducing BCG vaccine. It should be of great help in popularizing BCG vaccination because of its greater simplicity. As with the multiple puncture method, early allergy is induced and no abscess or scar formation is observed.

Serial tuberculin testing before vaccination must be done properly, using as the last test a strong dose of tuberculin in order to trace true non-allergic subjects. Vaccination of weakly allergic individuals, that is, those negative only to a low concentration of tuberculin, for example to Vollmer patch test or P.P.D. tuberculin 2/100 mgm., will bring on intensified and accelerated local reactions in one week, a local modified Koch phenomenon. The local reaction appears in the few hours following vaccination. It may become purulent and scar tissue is the usual sequel.

THE PERSISTENCE OF TUBERCULIN HYPERSENSITIVITY AFTER BCG VACCINATION

As yet, the knowledge concerning the persistence of tuberculin hypersensitivity due solely to BCG vaccination is very limited, and owing to the present distribution of tuberculous infection, it is difficult to be appreciated. There always exists the possibility of a sub-clinical natural infection, superadded to that of BCG and maintaining the allergy. That probably explains why, on that subject, the authors are at variance: some state that the allergy fades away in two or three years and others say that it persists even ten years after BCG vaccination.[27 to 32]

The Scandinavian authors insist upon the revaccination of all subjects who, having been previously vaccinated by the intradermal method are found negative to tuberculin six weeks later. It is granted that a positive reaction to tuberculin after vaccination is, for the moment, the only criterion of the absorption of the vaccine and of the probable building up of a state of resistance. However, with wide-scale BCG vaccination, this practice of immediate tuberculin control might seem somewhat costly and useless, if one thinks that, for the sole detection of a small percentage of negative subjects, all those vaccinated should be submitted to the immediate tuberculin control tests. With the use of modern methods of vaccinations, namely intradermal or transcutaneous, nearly 100% of positive reactions are obtained within six weeks. It appears unnecessary to test systematically all such vaccinated subjects who may be considered from a practical point of view, already allergic at the end of the above-mentioned period. Moreover, when the tuberculin reaction is negative in a newborn, it should be remembered that the cutaneous reactivity at this age is not always reliable. After six months of age, the skin of the child will show more accurate hypersensitivity.

Obviously, in order to obtain an early and prolonged allergy, one should use appropriate concentrations and dosage of vaccine. From a practical point of view, when using modern methods of vaccination and the appropriate concentration and dosage of vaccine, the first collective tuberculin control of the subjects thus previously vaccinated could be relayed until about two years after the last vaccination. There is, however, no objection to the practice of the yearly control when necessary.

A few physicians contend that BCG would sensitize the organism to the point that it would react later to the natural tuberculous infection in a more destructive manner. Such a tuberculous disease would present the "reinfection" or the "adult" type of tuberculosis. However, experimental and clinical facts do not support this contention; the hypersensitivity to tuberculin and to bacillary proteins, as conferred by BCG, is of a weaker type than that conferred by virulent bacilli; with the dosage of BCG used for human vaccination, there can be no fear of producing a tissue hypersensitivity similar to that which is acquired by the organism following a virulent primary infection; radiologic examination shows that the primary tuberculous infection in the vaccinated subjects is considerably reduced in importance; statistical data establish that the tuberculous morbidity is reduced as well as the mortality in BCG vaccinated subjects; clinically, tuberculosis is less severe when it appears in vaccinated subjects. Moreover, at present many phthisiologists, radiologists and pathologists are of the opinion that the concepts of "reinfection" or "adult" type of tuberculosis are to be revised, because phthisiogenesis cannot be explained in so simple a manner.

INFRATUBERCULIN ALLERGY—THE BCG SCARIFICATION TEST

In 1945, in the course of investigations on the respective allergizing value of the multiple puncture and scarification methods, we noticed an important percentage of individuals of all ages, who, although negative to a strong dose of tuberculin (5 mgm. tuberculin P.P.D.), pre-

sented, when vaccinated with BCG vaccine, in the 24 to 48 hours immediately following vaccination, accelerated and intensified local reactions, somewhat similar to the reactions observed in "weakly allergic" subjects. This type of allergy to total bacillary bodies has been recently called by South American authors,[33] "the infratuberculin allergy". We have gone into the investigation, in a rural health unit and in Indian reserves, of the incidence of infratuberculin allergy. Our results correspond closely with the figures of Rosemberg,[34] of Brazil, and Andenoes,[35] of Scandinavia. This incidence may be as high as 20% in subjects not BCG vaccinated. It is three times as high in subjects previously vaccinated with BCG and who have become anergic.

Another characteristic of this infratuberculin allergy is the production of the Baldwin-Gardner-Willis-Sayé phenomenon, which consists in a remarkable shortening of the pre-allergic period following BCG vaccination. In our series of investigations, this phenomenon has been observed in 100% of cases. But it is not a constant phenomenon, since Saenz and Canetti[36, 37] reproduced it in only 43% of cases, and Coste, Barnaud and Hervet[38] in 83% and Rosemberg in 66% of cases. The differences in percentages may very well be due, not to the inconsistency of the phenomenon, but to the more or less weak dose of tuberculin used in testing infratuberculin allergic subjects.

In the course of these studies, we wondered whether a scarification test for total bacillary bodies like BCG could not be made into a practical test for detecting all tuberculous infection, and so replace the serial tuberculin tests which prove somewhat time- and money-consuming. Various concentrations of BCG have been experimented with in order to find the optimal concentration capable, on the one hand, of revealing a modified Koch reaction in the least sensitive individuals, but incapable, on the other hand, of provoking too intense reactions in strongly allergic individuals. Further research is needed to confirm our preliminary contention of an optimal concentration located between 10 and 25 mgm. of BCG per c.c. The technique is much the same as the Von Pirquet reaction, save that BCG is substituted for tuberculin. The ideal time of reading is 48 hours after the test, when comparison between the BCG and the control scratches is easily established, the traumatic reaction having practically disappeared. We used live BCG, since this test might then constitute a booster dose in reinforcing the resistance of the infratuberculin allergic as well as the "weakly allergic" subjects.

A similar but intradermal test, reported by Bueno, is presently used in Brazil, where de Assis[39] uses 1/10 mgm. of killed BCG. In France, recently Chaussinand[40] has also advocated the intradermal route and reported para-allergic reactions. With leprosy[41] Ustvedt,[42] in Norway, has recently used a puncture method which is called "BCG diagnostic".

INTEGRATION OF THE BCG VACCINATION IN THE PROGRAM OF TUBERCULOSIS CONTROL

As Calmette wrote twenty years ago, BCG vaccination affords an appreciable but relative resistance and should not be substituted for any other method of tuberculosis control, but it must be added to the antituberculous armament as a specific weapon which will certainly help in reducing, not only mortality, but also morbidity by tuberculosis. May we insist on the timely advisability of rationalizing the use of BCG vaccine. We have made experimental attempts in the study of a practical plan for the use of BCG vaccine in the field of public health in the Province of Quebec. This plan has been worked out among the Indians under the auspices of the Federal Department of Health and Welfare, Indian Section, as well as in the Health Unit of Verchères, of the Province of Quebec, with the co-operation of Dr. Roy.

A BCG vaccination program begins with a tuberculin survey, since no positive subject needs BCG. Taking that into account, it is easily seen that such a tuberculin survey should be co-ordinated with a program of detection of tuberculosis in the population. It is obvious that this co-ordination is necessary between the various institutions concerned with BCG vaccination and with case-finding. Some sort of authority should be entrusted with the power of organizing, controlling the BCG vaccination in every province, and well co-ordinating the efforts of different social services and anti-tuberculosis bodies interested in BCG vaccination.

We have proceeded to the tuberculin testing of different communities in the Province of Quebec, starting with the school population.

School children found negative were vaccinated at once. Those found positive were directed to the tuberculosis clinics for a thorough examination and their relations called to the same clinics for a similar check-up. Newborn were systematically vaccinated by the attending physicians or the nursing personnel. Every two years, a tuberculin survey is made and revaccination of anergic subjects performed. Hospitals and sanatoria are also urged to make BCG vaccination compulsory for their personnel who are negative to tuberculin.

We consider that the school children give an excellent picture of the incidence of tuberculosis among our population. By testing them with tuberculin, two aims are reached: first, the vaccination of the negatives which should be done systematically in our surroundings; second, and this is the most important, an investigation into the families and surroundings of the positives, by means of a tuberculin survey: the negatives are BCG vaccinated and the positives examined. An appeal is made to those families of the positive children, either by letter or by direct contact through the social services, and they are urged to come to the BCG clinics or dispensaries in order to be tested, examined and vaccinated, if necessary. Those who do not answer this call are visited at home by the social services and offered transportation to the clinic for examination.

All newborn from tuberculous families should be isolated in a BCG clinic where they are vaccinated. They are brought back into their family only when found positive to tuberculin. For ten years, Dr. Guilbeault, at the BCG Clinic of Montreal, has followed up and surveyed over 500 of such children, isolated at birth from tuberculous families and who have thereafter lived in contact with proved cases. None of them has yet died of tuberculosis and only three have developed a mild clinical disease. Such results show that BCG vaccination, completed by isolation and follow-up, may contribute in realizing nearly 100% protection.

It is obvious that a co-ordinated antituberculous program integrating BCG vaccination will realize an economy of time, effort and lives. No doubt that tuberculin surveys of the families reach into the nest of tuberculosis and that it should constitute the foundation in the detection of tuberculosis and should be continued with BCG vaccination. At the same time, it helps provide education for those families and makes them fully conscious of the dangers of tuberculosis.

Those to be vaccinated first are the individuals in more immediate danger of infection. But one must remember that tuberculosis is a most insidious disease: nobody knows the mode, the time, the dose and the future of his potential tuberculous infection. No community may be kept closed to all imports from outside in a world where population movements are so facilitated by transportation. On the other hand, even radiologic and more elaborate clinical investigations cannot detect all cases of tuberculosis. In such instances, the ignored tuberculous patient, even if he does not bring massive infection to the community, can originate sporadic epidemics of tuberculosis and remain an unsuspected reservoir. Phthisiologists agree that nearly 50% of the tuberculous cases contract the disease from unknown sources. No doubt, mortality rates have been reduced considerably by non-specific control measures, but morbidity rates have not, in general, shown the same decrease. BCG vaccination would constitute an appreciable protection against such insidious contacts and then contribute in further reducing tuberculous morbidity and mortality.

As a conclusion, let us adapt a phrase credited to King Edward VII of England: "If tuberculosis is preventable, why not prevent it?"

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RÉSUMÉ

Les auteurs rappellent l'historique du B.C.G. au Canada et les résultats obtenus par le professeur Baudouin de Montréal et ceux du Dr Ferguson de Saskatchewan. Ces travaux montrent que la vaccination a apporté une protection efficace de 72% à 80% pendant 5 ans dans des milieux tuberculeux. De 1926 à 1948, 206,000 personnes ont été vaccinées au Canada et chaque année 20% des nouveaux-nés du Québec le sont. Les auteurs préconisent la scarification à la région lombaire comme méthode idéale de vaccination. Les voies intra-dermique et sous-cutanée causent des abcès et la voie orale est trop lente. Les épreuves à la tuberculine doivent précéder l'administration de B.C.G. Le seul critère actuel pour contrôler la résistance de l'organisme et l'efficacité de la vaccination nous est fourni par ces épreuves. Cependant les auteurs ne jugent pas nécessaire de faire systématiquement cette épreuve au bout de six semaines car avec les méthodes modernes de vaccination on peut s'attendre à presque 100% de réactions positives. La durée de l'hypersensibilité à la tuberculine est encore sujette à débat. Les auteurs résument leur expérience avec l'emploi du B.C.G. en scarification comme une épreuve pouvant remplacer la tuberculine dans le dépistage des infections tuberculeuses. Cette allergie aux bacilles complets a été appelée allergie à l'infra-tuberculine par des auteurs de l'Amérique du Sud. Les auteurs insistent sur l'importance d'établir un programme pour régler la distribution du B.C.G. parmi la population et citent les travaux actuellement faits dans la province de Québec. YVES PREVOST

SOME UNANSWERED QUESTIONS IN CLINICAL ALLERGY

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WHAT I have to say to you is prompted by my hearing a prominent allergist some time ago somewhat contemptuously belittle the lack of progress being made by practising allergists in their specialty. His thesis was, that in the rapidly expanding field of allergy, contributions were only being made by workers other than allergists—by pathologists, immunologists, chemists, etc. He cited the work on vascular allergy as it pertains to periarteritis nodosa, disseminated lupus erythematosus, dermatomyositis, and other members of the "visceral arteritis" group, including the hypersensitive aspect of rheumatic fever. He also mentioned the work of Landsteiner and his associates in the conjugation of chemical allergens, as well as the newer conceptions of drug allergies. Now all this is very fine. I would be the last to ever wish to hamper scientific progress. But this man somehow left the impression that he thought we have gone about as far as we can go in our investigation of the everyday clinical allergies such as hayfever, asthma, and eczema. He thought we were wasting time looking for and reporting new allergens, or searching for refinements of treatment. In other words, he thought we should lift our sights and join the ultra-scientists on higher levels of speculative research.

Unfortunately, most of us have to make our living treating people affected by the more common manifestations of allergy. I certainly would not get far if my practice were limited to the visceral arteritis group of diseases, or the occasional instance of drug allergy that I see. But what is more to the point, we allergists have not even come close to solving the riddle of any one of the clinical problems with which we are daily confronted. In the first place, we do not know what makes people allergic—how they become that way. I like to think of our present knowledge of allergy as an ocean of ignorance with an island of fact jutting up here and there. As you all know, there is not a single aspect of allergy that does not have many unanswered clinical questions. I shall not attempt to enumerate them all. May I call your attention then to some of the problems found in the three most common instances of clinical allergy; namely, hayfever, eczema, and asthma.

With regard to hayfever, what do we accomplish by our present accepted method of treatment, consisting of injections of the causative pollen allergen? People do get relief from our injections; but why? At first, we thought we were actually desensitizing our patients by causing the sensitizing antibody, or reagin, to be neutralized by the pollen antigen injected. This

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was soon shown not to be the case. People did not stay desensitized, and besides it was found that the amount of reagin is often increased, even after long-continued treatment. So now we know that we merely *hyposensitize* with our injections of antigen.

About 1935, Cooke and his co-workers announced the discovery of the so-called "blocking antibody". This antibody is produced by the injection of pollen antigen. It is heat-stable and can be differentiated in the serum of treated individuals from the sensitizing antibody (reagin) which is destroyed by certain degrees of heat. It is assumed that this blocking antibody has a greater affinity for antigen than does reagin. It combines with circulating antigen, blocks or neutralizes it, and thus accounts for the beneficial effects of the pollen injections. However, it was soon discovered that often there is little relation between the clinical result and the amount of blocking antibody produced. A patient may have an excellent clinical result from treatment with a minimal amount of blocking antibody demonstrable, or the reverse may be true. Consequently, a clear-cut explanation based on the *modus operandi* of the blocking antibody has not yet been found. Dr. Mary Loveless, the chief exponent of the blocking antibody, quotes Coca to the effect that "The protective mechanism must neutralize either the sensitizing antibody (reagin) or the antigen". Since the sum total of pollen antigen given during a course of treatment is sufficient to neutralize only a small fraction of the reagins, and since it is well established that reagins are not diminished by therapy, the relief of hayfever cannot be attributed to desensitization. This situation leaves, to continue the quotation, "only one other conceivable explanation of the phenomenon we are discussing; namely, that it is the result of the formation of neutralizing immune antibodies."

Now I do not know the answer as to why people get benefit from pollen antigen injections, but I must say this blocking antibody hypothesis cannot be ignored. We all know that our pollen extracts contain several antigenic fractions. Dr. Milton Cohen says we inject our patients with soup—meaning that we have not isolated the specific antigenic fraction or fractions. It is even known that there are carbohydrate, as well as protein, fractions in the ragweed antigen. Might it not well be that one fraction in the pollen extract stimulates the sensitizing antibody (reagin), while another stimulates the immune or blocking antibody? Various lots of pollen extract will at times contain more of the fraction that stimulates reagins, thus leading to poor results. If the protective stimulating fraction is in the ascendancy, we will get a good result. Therefore, I suggest one of you could well devote yourself to a study looking to isolation of the protection-stimulating fraction from the pollen antigen complex. Such a fraction, if it exists, might even be used to stimulate specific antibodies in animals; these antibodies could be concentrated so that a few doses would give ample protection.

Now let us consider the eczema problem briefly. While my remarks pertain chiefly to infantile eczema, they also apply to so-called atopic dermatitis of older children and adults, for I regard eczema and atopic dermatitis as one and the same process. In infancy, one sees it as a pure expression of cutaneous allergy, uncomplicated by certain extraneous factors that involve the adult type. For years, the allergist has gone blithely on his way, doing innumerable and intradermal tests on all his eczema cases that could be held quiet enough for the tests. He obtained many positive reactors and usually prescribed elimination diets based on these reactors. The results were often discouraging, so that the whole eczema problem today is largely a headache. Recently, Robert A. Cooke announced the following dictum:

> "Intradermal and scratch tests must be discarded as diagnostic procedures in eczema. The usual positive wheal reactions in infantile eczeme have nothing to do with the eczema—they may be looked upon as a portent of things to come in the way of asthma or hayfever. Patch tests and clinical tests by exposure to the antigen are the only methods available today for etiologic diagnosis."

Well, this was more than Lewis Webb Hill could bear, so in the January, 1947, issue of the *Journal of Allergy*, in a masterly presentation entitled "The Pathogenesis of Infantile Eczema", Hill gives his views on the subject. I earnestly recommend that you read the article—or re-read it—and can do no better than to quote his conclusion in its entirety:

> "Surely, nobody understands infantile eczema; there are weak spots in the theories of everyone. When there are weak spots in the foundation, no enduring structure can be raised on it. The house is not built upon a rock. Therefore, any theory which tries to explain infantile eczema at present is not likely to be correct, for the gaps in the foundation must be filled in by ideas suggested by other facts, rather than by facts themselves.
>
> "A theory is a verified hypothesis. Therefore, one is not justified at present in formulating a theory. It seems to me, however, that from what little we do know

concerning the pathogenesis of infantile eczema, the following might be looked upon as a working hypothesis, to be proved or disproved as more facts accumulate.

"1. The young infant, as a rule coming from a family which is subject to hay fever, asthma, or eczema, becomes, at an early age, and before he has eczema, violently sensitized to some food, usually egg white, but possibly to some other strong sensitizer, such as fish or nuts. The mode of sensitization is either through the placenta in intrauterine life, or through the breast milk after birth. There are arguments for and against both of these modes. The main point is, however, that the sensitization is, as a rule, an extremely violent one, and that it takes place at an early age. The fact that newly born infants do not give positive skin tests to egg is not necessarily against the theory of intrauterine sensitization, for it is well known that young animals of any kind form antibodies very poorly, and it takes them a long time to do it. It is not impossible that the infant may have been sensitized to egg *in utero*, and that the development of antibodies does not reach the point where skin tests or reagins can be demonstrated for some time after birth.

"It has been proved that egg white can be secreted in breast milk, and thus ingested by the infant. It seems reasonable to suppose that some infants may be sensitized this way. The fact that infants who have never taken any breast milk are not uncommonly sensitized indicates that this is not the universal mode of sensitization.

"2. At about the time the egg antibodies begin to be demonstrable (3 to 4 months), the baby begins to have eczema. It rarely starts before this. At this time it may also be demonstrated that there is skin sensitivity to other allergens—ingested or sometimes environmental (milk, wheat, dust, feathers).

"3. Inasmuch as the infant eats no egg, it is not the cause of his dermatitis. If he is given egg in fairly large amounts experimentally he will react with urticaria, which will be followed by exacerbation of his eczema (quick reaction time of urticaria, slow of eczema). If he is given continued small doses of egg, under the urticaria threshold, there will be exacerbation of his eczema. If he is injected with a large amount of egg (Woringer) so that he has massive urticaria and shock, his eczema will temporarily disappear for a few days, only to recur later (antianaphylaxis).

"4. This violent sensitivity, commonly to egg, and usually monovalent, may be called the *primary sensitization*. Although the food responsible for it is not causing the infant's eczema, this primary sensitization is important, for once a sensitization of high degree has become fixed in the infant, he tends more easily to become sensitized to other food and environmental allergens. The primary sensitization paves the way for secondary sensitization, which might occur were the primary one not present. *This is the infant's admission ticket to the fraternity of the allergic.*

"5. The first secondary sensitizations are to foods which the infant commonly eats (milk, wheat) and to environmental allergens to which he is commonly exposed (dust, feathers). Secondary sensitizations to environmental allergens may be violent (ragweed, cat hair, horse dander). The secondary sensitizations to foods which are *eaten daily*, however, are rarely violent (milk, wheat), and these foods do not commonly cause urticaria when ingested, because the degree of sensitivity is not high enough. They cause *eczema* by repeated and continuous absorption.

"6. The infant must have absorbed unsplit food protein at some time, in order to have developed a positive skin test. If, after a short time, he no longer absorbs it, which is often the case, his positive skin test is without etiologic significance. The *skin test is of etiologic significance as long as the infant does absorb unsplit protein.* The skin test may persist for a long time (years) after he has stopped absorbing unsplit protein, and the majority of positive skin tests to foods in older children and in adults are of this variety so far as eczema is concerned. If no food protein is absorbed, no damage to the skin can result from ingestion of the corresponding food, no matter what the skin test may be.

"7. Although the primary sensitization of the infant is to food, if he is exposed to environmental allergens he becomes readily sensitized to them, and they may be important factors in the causation of his eczema, either by external contact or by inhalation. The older the individual, the more important are environmental allergens, and the less important are foods.

"8. In the infant, the epidermis may be involved in the inflammatory process more than the corium. Inasmuch as there are no blood vessels in the epidermis, and as there can be no inflammation independent of vascular participation, it does not seem likely that the epidermis itself is sensitized, but that the eczematous response originates in the small papillary vessels just below it.

"9. An allergen, whether food or environmental, may give both scratch and patch tests, and by ingestion or by contact may produce sometimes urticaria, sometimes eczema, according to the presence or absence of many variables.

"10. Infantile eczema has elements of both 'atopic' and 'contact' dermatitis in it. Therefore, patch tests applied to the surface of the skin may supply useful information concerning etiology. So may the urticarial type of reaction produced by scratch or intradermal tests, and they should not be discarded. There is ample proof that allergens giving this type of test can and do produce eczema as well as urticaria. The fact that these tests commonly give an urticarial and not an eczematous type of reaction is no valid argument that the allergens producing them do not, under certain conditions, produce eczema."

After listening to the above, I think you will agree with me that there is still plenty to be done in solving the eczema problem.

With regard to the asthma problem, we have a fair batting average in that we can help, although not cure, a goodly number. There is a group af asthmatics however—possibly 10%—which baffles us. In addition to unusual severity and chronicity, practically all display an associated nasal allergy with high incidence of polyposis; common occurrence of emphysema; eosinophilia in the blood as well as in nasal and bronchial secretions; usual absence of skin reactions to specific agents which might explain the chronic asthma; a poor prognosis of the asthma, which not infrequently has a fatal outcome. This group of cases is often called the "intrinsic" group because a definite exogenous factor cannot be identified. They are also labelled as cases of "infective asthma"; there are many adherents to the belief that skin-test negative cases are practically synonymous with infective asthma. It is claimed that sensitization occurs to bacterial products arising from infection in the sinuses, nose, throat, and elsewhere. Experience indicates that immediate whealing skin reactions to bacteria are not present, nor are circulating antibodies demonstrable. Conclusive evidence as to the existence in these cases of bacterial allergy, both clinically and immunologically, is incomplete. Therefore, I,

for one, do not subscribe to the belief that these so-called intrinsic cases are due to bacterial allergy.

Recently, Friedländer and Feinberg reviewed the findings in a series of 45 patients belonging to this intrinsic group, who were aspirin sensitive. In each, the ingestion of a small amount of aspirin resulted in an immediate severe paroxysm of asthma. I now quote from their paper:

"It is hardly possible to incriminate aspirin as the agent responsible for the persistent chronic intractable asthma, which occurs apart from the infrequent acute episodes following the ingestion of the drug. Yet it is apparent that there is some connection between severe chronic asthma and drug sensitivity, of which aspirin is the most common example, due probably to its extensive use. The concept has long existed that simple chemical substances are incapable of reacting with antibody unless previously joined in some manner to a larger molecule. That such a conjugation between the smaller molecular constituent (hapten) and body protein may occur to form a new antigenic complex is supported by the work of Landsteiner and associates. A mechanism such as this might then explain the absence of immediate skin tests to chemical compounds. Since aspirin may repeatedly produce severe episodes of asthma, yet fail to give a positive skin reaction, it appears logical to suspect that the chronic symptoms encountered in these cases may be due to repeated or continued exposure to substances of a simple chemical nature which, because of some difference in the immunologic mechanism, are incapable of giving a skin reaction. It is possible that aspirin sensitivity is merely an indication that the individual has acquired the mechanism to react to simple chemical compounds. Such substances could conceivably be present in the diet, or some environmental factor as smoke, paint, or chemical fumes."

The authors then cite instances where in isolated cases patients have been found who give positive skin tests with positive passive transfer, to simple chemicals such as phthalic anhydride, platinum chloride, and chloramine. They say: "These unusual instances demonstrate that the immunologic mechanism of drug allergy may not be far removed from that encountered in the usually recognized protein sensitization."

I give you this concept of sensitization to simple chemicals — either by ingestion or inhalation—as a possible cause of so-called intrinsic asthma, with the hope that it will set you thinking. Certainly the old conception of the infectious nature of intrinsic asthma has led us up a blind alley. Two other thoughts regarding this intractable, idiopathic type of asthma, let me leave with you. One is as to the progressive, irreversible nature of this group of asthmatics. They inevitably soon develop pathological changes such as polyposis, emphysema, fibrosis and atelectasis that lead to great impairment of the cardio-respiratory mechanism. Ordinary extrinsic asthma seldom leads to such profound changes. What is there about the obscure cause of intrinsic or idiopathic asthma, that soon leads to such grave damage? This leads to my second thought which is, that if we are going to help these people at all, we must do it early, before the irreversible pathological changes set in. In treating status asthmaticus, we only treat the symptoms caused by these irreversible pathologic changes. Even if we knew the original cause, it would still be too late to restore the patient to good health.

What I have tried to point out in my discussion is that clinical allergy still embraces more unanswered questions than known facts. The frontiers are far from being closed: they continue to retreat as we advance. If my talk touches off an investigative spark in any one of you, I shall feel well repaid.

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PREGNANCY IN THYROTOXICOSIS UNDER TREATMENT WITH THIOURACIL

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WE wish to report a case, concerning the management of which we have had some anxious moments and not a few misgivings. So far as we have been able to ascertain, there have not been many similar combinations of circumstances reported in the literature.

A nulliparous, 26-year old married French-Canadian woman came to us on April 7, 1946, complaining of nervousness, irritability, loss of weight and appetite, and persistent non-productive cough. Her past history contained nothing significant. Her present complaints go back approximately two years, during which time she gradually noticed easy fatigability, restlessness, poor appetite, and some loss of weight. She also complained of a throbbing sensation in her throat, accompanied by pounding of the heart. These were quite noticeable after mental or emotional stress, and during the past eight to ten months would occasionally come on at night, waking her up. When these spells were most severe, she reports there was substernal tightness, with a little difficulty in getting her breath. Approximately one and one-half years ago, she consulted a doctor "because my mother thought I was developing an inward goitre". During the ensuing months, she was in and out of the hospital several times and was a constant visitor at the doctor's office. She stated that the reason for hospitalization was frequent "heart attacks". She stated that she was so worried about her bad heart and the fact that she could not have children that she didn't know what to do with herself. She smoked from 30 to 40 cigarettes daily. Her menstruation was normal (with no appreciable discomfort).

Examination revealed a slightly built, dark-complexioned, attractive, apprehensive, seemingly intelligent young woman. Height, 5′ 2″. Weight 98 lb. Her usual

weight was 115 to 120 lb. two years ago. Temperature, 98.8°. Pulse, 120, 110 after rest. The skin was moist and elastic. There was a constant fine tremor to the outstretched fingers. Eyes and eyelids were negative.

Physical examination otherwise was completely negative except for slight, moderate diffuse thyroid enlargement. Pelvic and rectal examinations were negative. Blood pressure 130/75. There did not appear to be any obvious cardiac abnormalities, even after exercise.

Laboratory findings: Urine negative. Hgb. (Sahli) 82%. Sedimentation rate 8 mm. in an hour (Cutler). A chest x-ray was negative. Red blood cells 3,900,000; Hgb. (Sahli) 80%; white blood cells, 10,400 polymorphonuclears 65%; lymphocytes 30%. Basal metabolic rates, plus 46 and plus 54%. Tuberculin patch test, negative. Blood cholesterol, 254 mgm. % (University of Alberta Biochemistry Laboratory). Her resting pulse rate ran between 110 and 118.

This was considered to be a case of thyrotoxicosis, and it was thought advisable to start thiouracil treatment, sedation and restricted activity.

On April 16, she was started on thiouracil 0.2 gm. t.i.d., elixir phenobarbital b.i.d. and h.s. She was discharged May 1, on thiouracil 0.2 gm. b.i.d. for a further two weeks and elixir phenobarbital t.i.d. All white cells and differential counts were within normal limits; her weight increased from 98 lb. to 104 lb., and her pulse rate came down to 80 or less. On May 15, thiouracil was reduced to 0.2 gm. daily.

She reported at from 4 to 7 day intervals. Each time white cell counts and differentials were within normal limits and her weight increased to 114 lb. on June 22. On this day, further basal metabolic rates were plus 11 and −4%. Thiouracil was reduced to 0.1 gm. daily. She stated that she felt very much better, had a good appetite, had lost a lot of her nervousness, was sleeping better, and "what was most important, she could wear her clothes more like she used to". She still had occasional episodes of pulsating in her throat, but these were far less frequent. Blood cholesterol at this time was 307 mgm. % (University of Alberta Biochemistry laboratory). The patient did not report again until October 19, in spite of advice to report earlier. She was still on 0.1 gm. thiouracil daily, and had no complaints.

On December 14, she again reported, stating that her last menstrual period was on October 1, 1946. She felt well, except for slight morning nausea, was eating regular meals, and was still taking thiouracil 0.1 gm. daily. Examination was negative, except for a few striæ gravidarum, somewhat enlarged uterus, palpable above the symphysis, a faint placental souffle. Resting pulse, 84; blood pressure 135/90; urine negative. White blood cells and differential within normal limits. Weight 103 lb. Diagnosis of early pregnancy was made, and the patient was put on ferrous sulphate gr. 15, and calcium lactate gr. 10 daily, along with thiouracil 0.1 gm. daily. Because of the loss of weight, (from 114 to 103 lb.) she was also advised to eat more protein and to increase her total food daily.

It was undecided as to what to do concerning the thiouracil. Could we expect a remission, after being on the drug for a total of slightly more than 8 months, or should the drug be continued for the time being? On the other hand, what could one expect the effect of thiouracil to be on the developing fetus? The drug was discontinued on December 29, 1946, following a suggestion by Dr. J. W. Scott, of Edmonton.

The remaining period of the antenatal course progressed uneventfully, until June 16, 1947. In the interim, no symptoms suggestive of a recurrence of excess thyroid activity appeared. It was found necessary to increase the ferrous sulphate to 60 grains daily to maintain normal hæmoglobin. At all times it was quite difficult to get this patient to report as often as one would like due to transportation difficulties. She reported on June 16, complaining of nausea, occasional occipital headaches, frequent "spots" before her eyes, some swelling of eyelids and ankles. The weight was 122 lb., blood pressure 145/95, urine albumen one plus. Abdominal examination showed a vertex presentation with regular fetal heart 150, heard on the left lower quadrant. Pelvic measurements were within normal limits. She was put on sedation, bed rest, restricted fluids and restricted salt diet.

On June 22, she was admitted to the hospital in labour and was delivered of a 5-lb. apparently healthy male child, after a manual rotation of an R.O.P. (by W.C.A.). The postpartum course was uneventful, she was allowed up on the first postpartum day, and was discharged from hospital on the 7th day, nursing the baby. Examination of the child revealed no apparent signs of cretinism, and no enlargement of the thyroid gland. It had a healthy, vigorous cry, nursed well, and seemed much the same as any other young baby in the nursery.

Post-partum examination on August 2, 1947, showed her uterus to be well involuted, with a healthy-looking, clean cervix. Urine negative. White blood count and differential within normal limits. She had no complaints, and was still nursing the baby, which weighed 11 lb. 4 oz. On September 11, 1947, a D. and C. was done for persistent vaginal bleeding with passage of

TABLE

SUMMARY OF THE REPORTED CASES IN THE LITERATURE IN TABULAR FORM

Author	*Date*	*No. cases*	*Preparation used*	*Duration of treatment*		*Effect on toxicity*	*Effect on child*
				Before pregnancy	*During pregnancy*		
Williams and Bissell	1943	1	Thiouracil	??	??	??	Apparently none
Rose and McConnell	1944	1	Thiouracil	None	12 weeks	Apparently satisfactory	None
Davis and Forbes	1945	1	Thiouracil	5 months	6 months	Apparently satisfactory —autopsy 6th month	Premature—hyperplastic thyroid
Eaton	1945	2	Thiourea, thiouracil and Lugol's Sol'n	None	5 months	Apparently satisfactory	None
				None	7 months	—both cases	Thyroid ++ —not enlarged at 3 months
Strouse and Drabkin	1946	1	Thiouracil	None	55 days	Apparently satisfactory	Not normal?
Williams *et al*	1947	9	Thiouracil, propyl-thiouracil and KI	3 for several months	1 month to longer	Satisfactory	None

clots, of 10 days' duration, not responding to oral ergotrate for the previous week, and with a Hgb. of 60%. The pathological report (University of Alberta) was "endometrium, proliferative phase". No decidual remnants were found.

On September 23, basal metabolic rate was + 3 and − 3; weight 107 lb.; Hgb. 78%. The baby was doing well on a formula, and still showed no signs of abnormal thyroid function. Her first menstruation post-partum began on October 2, and was just about the same as any of her previous menses.

This patient was last seen on January 16, 1948. At that time, she complained of a little substernal distress, pain, and rapid pulse on occasions. These followed emotional stress. She also thought that she was losing weight, and stated that her neck was more prominent than usual. Weight 100 lb.; resting pulse, 94; blood pressure 128/70; basal metabolic rate − 5, − 7; Hgb. 87%. At this time it was just over one year since the thiouracil had been discontinued. The thyroid gland seemed larger than at first, but was still quite soft. Her complaints will bear further watching and investigation, but again travel difficulties have prevented her from presenting herself. The baby appeared to be doing well, was taking the usual diet for a child of almost 7 months of age, and weighed 19 lb. 5 oz. It was sitting up by itself, and appeared bright and inquisitive.

There are a number of questions raised by this case. Of principal interest, naturally, is what effect we might expect the maternal thiouracil to have on the development of the fetus, and on the maintenance of pregnancy. Although for this patient, the duration of treatment covered only the first three months of pregnancy, we were still interested in the final effect. Secondly, was the abnormal bleeding, which commenced approximately seven weeks post-partum, related to retained products of conception or in some way to previous thiouracil treatment? Thirdly, what explanation, if any, could be offered for the high blood cholesterol ester values obtained on two occasions.

SUMMARY

From the reported cases and the one herewith, we find that 15 out of the 16 were on thiouracil or its derivatives during pregnancy for a stated period of from one month to seven months. Duration of treatment was not definitely stated in several cases. Apparently all cases, including the one who died, demonstrated a satisfactory reduction of toxicity. Of the living infants, one showed an enlarged thyroid gland at birth, with regression at three months of age; one was stated as being not normal, but later examination revealed no abnormality. Follow-up examinations are not reported on some of the patients treated. In the present case, the mother had a normal basal metabolic rate seven months after termination of pregnancy, and the child seemed an apparently normal child in all respects, although it was almost four times its normal birth weight. In the case of some of the nine patients of Williams *et al.*[9] a follow-up for a year revealed no abnormality of either mother or child.

We should think, from the reported cases, that at present the management of thyrotoxicosis during pregnancy can best be carried on with propyl thiouracil plus small doses of potassium iodide, with treatment if necessary to term and afterwards when indicated. The usual precautions concerning the blood picture are, of course, necessary. It is probably not wise to allow breast feeding if the mother is still on one of these drugs, as appreciable quantities are present in the human milk during treatment.

Concerning the occurrence of vaginal bleeding following pregnancy, without decidual remnants present, such as was encountered in this case, we have been unable to find in the literature any reference to possible relation to treatment with thiouracil. Likewise, the abnormally high blood cholesterol ester values, 245 and 307 mgm. %, have remained a mystery. In the first instance, the value was obtained with a basal metabolic rate of plus 46% and plus 54%, whereas one should expect a considerably lower value than normal. In the second instance, after two months of treatment with thiouracil, basal metabolic rates were plus 11% and minus 4%. So far, we have found nothing in the literature to explain these insofar as treatment with these drugs is concerned. We would be pleased if any information is forthcoming on these matters.

We would like to point out that, in a country practice, it is often impossible to have patients report as often as is desirable — snow-bound roads, mud, harvest operations, etc. — consequently, the laboratory procedures carried out on this patient were at a minimum.

We would like to express appreciation to Dr. A. F. Perl, formerly of Provost, for help in doing some of the basal metabolic rate determinations, and also to Dr. J. W. Scott, of Edmonton, for very helpful suggestions in the management of this case.

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ORGANIZATION OF A COMBINED DERMATOLOGICAL-RADIOTHERAPEUTIC CENTRE IN THE CANADIAN ARMY OVERSEAS*

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AS the second great war progressed, the size of the Canadian Armed Forces in England increased steadily. As might be expected, skin diseases began to appear in increasing numbers. Many of the cases of chronic skin disease could not be returned to duty without the benefit of x-ray therapy. As none was available in any of the Canadian hospitals before June, 1943, these cases were, of necessity, referred to a civilian hospital. Middlesex Hospital, London, co-operated to the full and treated many of our skin cases, thus aiding in their return to duty. This excellent co-operation was much appreciated by the Canadians, but it was essential that a therapy unit, owned and operated by a Canadian staff, should be available for the Canadian Armed Services in England.

In 1941, the question of instituting radiotherapy in the Canadian Army overseas was discussed at meetings of the Canadian Association of Radiologists. It was felt that the amount of work required did not justify the installation and operation of a separate radiotherapeutic service. However, by 1943, the amount of work had increased considerably and, as a therapy unit had become available, it was decided to install it in one of our Canadian hospitals. The machine was installed in No. 8 Canadian General Hospital at Farnborough, England, in June, 1943, under Major E. W. Spencer, radiologist, and treatments were carried out under his direction for four months.

In October, 1943, the Director of Medical Services at Canadian Military Headquarters decided that the Canadian Military Hospital, Leavesden, under command of Col. H. P. Hamilton, should become a dermatological-radiotherapeutic centre. It was a 1,200-bed hospital some twenty miles north west of London, England. The x-ray therapy machine was transferred to this hospital at once. It was a General Electric X-Ray Corp. Model K X 10. This unit was capable of being worked over a range of 60 to 140 k.v. It was a shock-proof, ray-proof apparatus, quite easy to handle, but not completely mobile as it had a water-cooling system which had to be connected to the main water supply. Although it could not be moved from room to room because of this, yet it was quite mobile in the treatment room so that a patient could be treated in any position and on his own stretcher if necessary. As there was considerable scattered radiation about the machine, the control panel was removed and placed behind two large screens and connected by long cables to the machine. In this way, the operator had protection, but could view the patient at all times through the lead glass windows in the screen. After the installation of the machine, it was calibrated by a physicist of the King's Fund Panel of Physicists sent from the Physics Laboratory, Middlesex Hospital, London. This panel provided trained personnel for calibrating the machine whenever requested. Without their aid in calibration, therapy would have been very inaccurate and possibly dangerous.

After considerable discussion with Colonels L. C. Montgomery and J. A. MacFarlane, the consultants in medicine and surgery, respectively, the dermatologist and radiologist drew up a plan of organization and operation which remained in force until the machine was dismantled in December, 1945. The following points were considered as fundamental and were always adhered to. They might well prove to be an excellent working arrangement for many civilian hospitals in Canada.

1. All patients with skin diseases who were possible candidates for superficial x-ray therapy were first seen by the dermatologist and a report written by him. Every effort was made to arrive at a diagnosis before treatment was suggested and, if indicated, a note was made that this patient was considered suitable for x-ray therapy.

2. The patient then saw the radiologist who made his own notes on the patient's history and outlined the treatment which he proposed to give. The radiologist had the right to refuse to treat any case in which he thought treatment was not indicated.

3. At the first treatment, all the factors of dosage, including voltage, amperage, distance,

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time, filters and size of areas treated, were recorded and the dosage in "r" units set down.

4. Previously, the dermatologist and radiologist had discussed in broad outline the dosage for each disease likely to be treated, but the actual technique was left to the radiologist. At no time was there any serious disagreement regarding single or total dosage. In this way the patient had the benefit of two independent opinions. In the case of a negative opinion from either, treatment was not instituted. This was believed at that time to be an ideal arrangement and nothing happened during the two years of operation to change that opinion.

Having decided on these broad fundamentals, the next step was to organize for the treatment of in-patients and out-patients. The in-patients presented no problem. The history and physical examination were recorded and a diagnosis made before the patient was referred to the x-ray department. Frequent progress notes were made on the patients' history so that an accurate record of response to x-ray therapy resulted. An out-patient clinic for patients considered as candidates for x-ray therapy was arranged for two days a week. These patients saw the dermatologist first where a consultation report was written before they proceeded to the x-ray department. In the circular letter sent over the signature of the Director of Medical Services, the fact was stressed that "patients must not be referred for x-ray, but must be referred for diagnosis and treatment". In this way, if the patient was not deemed suitable for therapy, the referring medical officer lost no prestige in the eyes of his patient and the patient did not feel that he was improperly handled.

The following conditions were considered suitable in the main for x-ray therapy in the armed forces overseas:

1. *Carbuncles, boils and sweat-gland abscesses.* If treated early, some of these were aborted before suppuration set in and the patient was returned to duty quickly.

2. *Lichen simplex chronicus (neurodermatitis) and chronic eczema.*—Frequently a few doses of x-ray cleared these stubborn cases when topical remedies alone had failed.

3. *Seborrhœic dermatitis.*—When topical and general remedies had been tried and failed, x-ray therapy was used in the stubborn, chronic cases.

4. *Contact dermatitis.*—When suitable local treatment had reduced these cases to a chronic phase, it was frequently necessary to give x-ray treatments in order to clear them up completely and return them to duty. This was particularly true of sulfonamide dermatitis and patients were treated and returned to duty who would otherwise have had to be repatriated to Canada.

5. *Pruritus ani and perinei.*—For these cases, x-ray therapy was recommended when all local disease had been ruled out and other types of treatment tried and failed.

6. *Plantar warts.*—It is of interest that in nearly 50% of cases referred to the therapy centre as plantar warts, the lesions were corns and calluses. It was the usual practice at Leavesden Hospital to refer all cases of plantar warts to the dermatologist and radiologist for their opinion regarding radiation therapy. Thus, cases admitted to surgery were usually so referred. The technique used involved a heavy, single dose of x-ray to a closely shielded area. If, due to number of warts, size or location, this procedure was deemed unwise, the warts were then usually electrodesiccated under general or local anæsthesia. All other types of warts including flat warts and multiple warts on hands were considered unsuitable for radiation therapy. The odd exception was made in the case of single warts on the hands which had resisted other types of treatment.

7. *Acne vulgaris.*—These cases were extremely numerous in both male and female personnel in the armed forces. It was decided at once to treat only those in which there was a definite disability. Chief among these were the severe acne conditions of shoulders and back which prohibited the wearing of a pack. Results in these severe cases were only fair. The odd exception of treating for cosmetic reasons only was made in the female personnel if it was felt that there was a definite mental upset as a result of the acne.

8. *Psoriasis.*—This disease was not treated by x-ray except under unusual circumstances such as returning a key man to his duty promptly. This was because of the probability of recurrence of the disease and the dangers of overdosage with repeated treatments.

9. *Folliculitis of the bearded area (Sycosis barbæ).*—Although an uncommon affection in civilian life, it was extremely common in the

armed forces overseas and a cause of tremendous loss of man-days. All cases were hospitalized and a thorough course of topical and general remedies tried. If these all failed, a consultation was then held as to the wisdom of x-ray depilation. This was felt to be a major procedure but was frequently necessary in order to return a man to duty. Many patients were returned to duty after depilation who otherwise would have remained in hospital for months.

10. *Dermatophytosis.*—Ringworm or fungous infections of hands, feet and groin were treated only when there was secondary eczematous change.

11. *Keloids.*—As treatments were prolonged, these patients were usually sent to Canada if the lesion was a disabling one.

12. *Skin cancer.*—Following a clinical diagnosis confirmed by a histopathological one, these cases were treated if the cancer was easily accessible to x-rays and was superficial in character.

As time went on, the number of patients referred for radiotherapy increased greatly. Soon, requests were received for treatment of Hodgkin's disease and various deep carcinomata. It was felt by the radiologist that these required higher kilovoltage than was possible with the K X 10 unit. Accordingly, he made arrangements for them to be treated at the Radiotherapy Centre, Middlesex Hospital, under Prof. B. W. Windeyer. Thus, these patients received the utmost in treatment before being returned to Canada.

From October, 1943, to December, 1945, the radio-therapeutic unit was under the supervision of Major Joseph Sommers, and all treatments were administered by him. In all, 955 patients were treated, and the patients included Canadian army, navy and air force personnel, together with Red Cross, firefighters and civilians. In addition, patients were treated from the British Army and civilian population, U.S. army, New Zealand army, and one Italian prisoner-of-war. These 955 patients were treated for 1,009 distinct disease entities and there were 4,882 visits to the therapy centre of which 4,560 were treatment visits and the remainder for observation only.

It is difficult to evaluate accurately the saving in hospital days and the return of service personnel to duty as the result of x-ray therapy. The chief saving in man power appeared to be in the chronic cases of eczema and dermatitis which improved but did not clear completely with topical remedies. Next in importance were the cases of folliculitis of the beard which had also resisted all usual topical remedies. Many of these were returned to duty that otherwise would have had to be repatriated to Canada. Most of the plantar warts were treated as ambulatory cases and so lost no time from their duties.

It is felt that the results obtained from radiotherapy in returning useful men to their duties justify the establishment of a skin therapy unit in any troop concentration of over 100,000 men. Armies of greater size should have several units located in convenient areas.

In the first great war there was no such setup, while in the second great war it took four years for the authorities to realize the need for a similar unit. It is hoped that the results obtained justify the immediate inclusion of a therapy unit in any active Canadian army of the future. The organization as outlined here should serve as a basis for any dermatological-radiotherapeutic unit in the armed services and might well serve as a guide for civilian hospitals in Canada.

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SOME INDUSTRIAL INJURIES OF THE SHOULDER JOINT*

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INJURIES in the neighbourhood of the glenohumeral joint comprise an important fraction of the total number of injuries sustained in industry. They may be conveniently divided into three main groups: (*a*) Major fractures of the shoulder girdle and proximal humerus. (*b*) Dislocations; (1) of the sternoclavicular joint, (2) of the acromioclavicular joint, (3) of the glenohumeral joint. (*c*) Musculo-tendinous ruptures and sprains. The first two groups, that is the major fractures and dislocations, are more than adequately dealt with in the standard textbooks dealing

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with traumatic and orthopædic surgery. Their treatment follows accepted principles and, in the main, the results are satisfactory. Of considerable frequency and importance, however, are the musculo-tendinous ruptures and sprains. These injuries are less well understood and, in general, are not well covered in textbooks. It is of these injuries that I wish to speak.

Before passing on to their discussion, it is pertinent to this discussion to remember that movements of the arm relative to the body are not only carried out at the glenohumeral joint, but are the result of movements which take place at four joints: (1) The sternoclavicular joint. (2) The acromioclavicular joint. (3) The scapulothoracic joint. (4) The glenohumeral joint. Unrestricted and controlled movements of the arm relative to the trunk depend upon the synchronous participation of all these joints. Each is controlled by specific muscle groups and each has its particular range of movement.

The arcs of movement at the shoulder girdle joints are: (1) Sternoclavicular joint 36°. (2) Acromioclavicular joint 20°. (3) Movements of the scapula relative to the chest wall correspond directly with the arcs of movement of the sternoclavicular and acromioclavicular joints. It follows, therefore, that the total excursion of the scapula upon the chest is equal to the sum of the arcs of movement at the sternoclavicular and acromioclavicular joints or 56°. (4) Movements of the humerus relative to the glenoid take place through an arc of between 90 and 120°.

The total range of movement then of the humerus relative to the trunk is the sum of all movements occurring at the sternoclavicular, acromioclavicular, scapulothoracic, and glenohumeral joints, or a total of nearly 180°, and if any of these joints is restricted in its range of movement, or if movement at any of these joints is abolished, the total reduction in the range of movement of the arm relative to the trunk will be equivalent to the reduction in movement at that particular joint. For example, if the acromioclavicular joint is arthrodesed, the reduction in the range of movement of the arm relative to the trunk will be 20°.

It was formerly thought that abduction of the arm to the right angle takes place entirely at the glenohumeral joint and that thereafter it is completed by rotation of the scapula on the chest wall. This conception is incorrect and has probably accounted for much confusion in the diagnosis and treatment of injuries to the shoulder joint. In actual fact, movements at all four joints take place at varying rates and at varying times, but all these movements are synchronous and not successive.

If the glenohumeral joint alone is considered, it is obvious that the requirements for movement at this joint are: (1) A stable but mobile scapula. (2) That the muscles controlling the scapula and the movements of the clavicle shall act synergistically with the muscles controlling movement at the glenohumeral joint proper.

Impaired function at the glenohumeral joint may be the result of injury to the joint surfaces proper, or injuries to the muscle groups controlling movement of the humerus relative to the scapula, or more chronic affections of the capsule or joint. In the main, four clinical syndromes are recognizable apart from the major bony injuries: (1) Acute traumatic cuff lesions, the most common and important of which are ruptures or partial rupture of the tendon of the supraspinatus muscle. (2) Chronic shoulder cuff lesions, notably supraspinatus tendinitis. (2) Adhesive capsulitis or periarthritis of the shoulder joint. (4) Lesions of the head of the long head of the biceps as it lies in the intertubercular sulcus.

Rupture of the supraspinatus tendon.—Rupture of this tendon may be the result of a definite injury or it may occur as a sequel to chronic supraspinatus tendinitis. Usually the type of injury which causes rupture is a fall on the point of the shoulder or a severe muscle strain, or the lesion may occur as a complication of a glenohumeral dislocation. The clinical features are striking: (1) There is pain in the shoulder joint and referred pain to the middle of the arm at or about the insertion of the deltoid muscle. (2) There is inability to abduct the arm from the dependent position. (3) The patient is able to maintain abduction if the arm is elevated from the side to a right angle. (4) Tenderness over the greater tuberosity which may be very severe. (5) The range of passive movements at the glenohumeral joint is frequently normal though painful. (6) X-ray examination may reveal no abnormality or there may be an obvious sprain fracture of

the insertion of the supraspinatus tendon with a visible detached flake of bone which lies above the humeral head.

Treatment.—As it occasionally happens that the above syndrome may occur with a mere sprain of the supraspinatus tendon, the initial treatment should be conservative and the arm should be placed in a position of abduction and external rotation. If, at the end of ten days, active abduction cannot be initiated, operation should be undertaken. The insertion of the supraspinatus is exposed through an A. K. Henry approach to the shoulder joint. Any blood present in the joint is carefully evacuated and the torn tendon is then sutured back in place. In many cases, it is a wise measure to carry out an acromionectomy at the time of supraspinatus suture as a prophylactic against the syndrome of chronic supraspinatus tendinitis or subacromial bursitis which frequently develops later if acromionectomy is not done. The arm is subsequently placed in a plaster of Paris cast and shoulder spica in a position of 70° of abduction, 10° of forward flexion and full external rotation. The cast is worn for four weeks, at the end of which time it is removed and active movements instituted. During the period in which the cast is being worn hand and finger exercises must be most assiduously practised.

Chronic supraspinatus tendinitis.—This condition occurs in heavy manual labourers and in housewives whose occupation entails frequent reaching upwards and lifting heavy weights. That it does not occur more frequently is due to the interposition of the largest bursa in the body, the subacromial bursa, between the acromial arch and the insertion of the supraspinatus, infraspinatus and teres minor muscles. Characteristically, the patient complains of pain in the shoulder joint, which is made worse by every movement of abduction and is particularly severe through an arc of humeral abduction between 70 and 90°. The arm becomes progressively more difficult to use. There is also tenderness on pressure on the outer aspect of the shoulder joint. It frequently is stiff in the morning and painful at night. On x-ray examination there may be calcification in the tendon of the supraspinatus muscle, the deposit being a calcareous material resembling toothpaste. In many cases calcification in the supraspinatus tendon may be silent for long periods and the shoulder joint may remain apparently perfectly normal until a fall or some minor shoulder strain provokes pain in the joint and an x-ray examination reveals that calcification in the tendon is far advanced. Repeated use and trauma causes progressively more severe pain and finally, in many cases, some unwonted unusual movement or strain may complete the injury and rupture the supraspinatus tendon. There is also pain referred along the axillary nerve, of the insertion of the deltoid and frequently also pain which reaches to the fingers and neck.

Treatment.—Chronic supraspinatus tendinitis with calcification should at first be treated conservatively. The most useful measure is deep x-ray therapy, applied through several ports to the shoulder joint proper, the total dose being in the neighbourhood of 1,200 to 1,800r. X-ray therapy frequently results in gratifying improvement with a decrease in pain and a substantial return of painless movement in the shoulder joint. If improvement is not obtained a careful review of the case is necessary and the differential diagnosis to be considered includes: (1) Degenerative arthritis of the shoulder joint—a comparatively rare disease. (2) Adhesive capsulitis. (3) Brachial neuritis. (4) Cervical disc syndrome. (5) Chronic peritendinitis of the biceps brachialis.

Degenerative arthritis is usually accompanied by pain and stiffness throughout the total range of movement at the glenohumeral joint. Symptoms are accentuated during bad weather. X-ray examination will normally reveal irregularity in the outline of the humeral head, sclerosis and irregularity in the margins of the glenoid. The condition is frequently relieved by heat and manipulation. Adhesive capsulitis will be more fully discused later in this communication. Brachial neuritis is usually accompanied by other signs of neuritis, tenderness in the distribution of the brachial plexus and definite impairment in the function of the small muscles of the hand. The cervical disc syndrome may cause considerable confusion. There is characteristically tenderness in the posterior triangle of the neck, pain on pressure over the spine of the 5th, 6th, or 7th cervical vertebræ, a positive Spurling's sign, wasting of the small muscles of the hand supplied by the affected nerve root, and characteristic radiological signs in the cervical spine,

notably narrowing of the intervertebral space between the affected cervical vertebræ. Myelographic studies may reveal a filling defect in the dural sheath. Chronic peritendinitis of the biceps brachii rarely occurs as a separate entity apart from adhesive capsulitis of the shoulder joint and its diagnosis will be discussed more fully in a later portion of this paper.

Treatment.—Rest is almost always contraindicated and it should be the first concern of the physician to maintain normal arcs of movement at the shoulder joint. Measures which are useful are: (1) Injection of 1% novocaine into the cuff below the acromion, the total volume injected being from 10 to 20 c.c. (2) Deep x-ray therapy. (3) Evacuation of calcified material from the tendon itself. (4) Much the most satisfactory method, acromionectomy.

Adhesive capsulitis of the shoulder joint.—This lesion is of particular interest and is not only common but gives rise to great disability. It has also been called periarthritis of the shoulder joint, frozen shoulder, stiff and painful shoulder, tendinitis of the short rotators, and Duplay's disease, who first described it in 1872. The pathology of the disease is essentially that the redundant capsule of the shoulder joint becomes adherent to the articular surface of the head of the humerus. There is a lack of synovial fluid in the joint; but the subacromial bursa is nearly always normal. A web of adhesions weaves itself around the glenohumeral joint and these are usually strikingly avascular. There is marked thickening of the capsule. Histologically, the lesion presents subsynovial fibrosis with considerable perivascular infiltration. The synovial membrane becomes discontinuous, synovial cells being almost absent in many places on the joint surfaces.

Clinically, females are affected as frequently as males and most patients are past middle age. Although not uncommon in both shoulder joints, it usually affects the right shoulder in right-handed patients and vice versa. Its etiology is unknown, but it probably results from repeated minor trauma of the shoulder joint or prolonged immobilization of the joint. It seems to occur as a sequel to a sprain or as a sequel to repeated minor sprains, such as take place in railway brakemen. It is also liable to appear after long periods of recumbency when movements of the shoulder joints have not been insisted on or where physiotherapy has been inadequate. It is also frequently found in heart disease and in this condition the left shoulder is more frequently involved. Professor Ford Connell and I have encountered in the last two years some twenty cases of adhesive capsulitis of the shoulder joint in association with severe myocardial disease.

Its onset is characteristically slow, beginning first with an aching in the shoulder joint and pain at the insertion of the deltoid. There may also be pain referred along the biceps muscle and variations in symptomatology with changes in the weather. There is marked limitation of abduction, internal rotation and external rotation of the glenohumeral joint. There is wasting of the deltoid muscle. X-ray appearances of the shoulder joint are usually quite normal, although in this condition it sometimes appears that the head of the humerus rides high in relation to the glenoid fossa. Arthrograms made in this condition are difficult of interpretation and have not contributed helpfully to diagnosis.

Treatment.—Since the condition is essentially one in which the capsule has become adherent to the anatomical and surgical neck of the humerus, manipulation under anæsthesia to break down these adhesions forms the basis of treatment. The patient should be fully anæsthetized and completely relaxed and the shoulder joint should be put through its full range of movement either at one operation or at several. Following manipulation, it is of vital importance that the extra range of movement regained should be maintained by exercises controlled by an efficient physiotherapist. The majority of cases recover under this treatment, but the period required may extend to three months. If, at the end of that time, full movement has not been regained, it may be surmised that the tendon of the long head of the biceps is implicated in the disease and requires excision.

Chronic peritendinitis of the biceps brachii.—This condition is comparatively uncommon and occurs usually as a sequel to a sprain or as part and parcel of an adhesive capsulitis of the shoulder joint. It will be remembered that the tendon of the long head of the biceps lies in the intertubercular sulcus surrounded by a sheath or synovial membrane which is continuous with the synovial lining of the shoulder joint. The intertubercular sulcus itself is a trough which varies in depth and which is converted into a tunnel by the transverse ligament

of the humerus, a broad fibrous ligament lying between the lesser and greater tuberosities. In this tunnel the tendon of the long head of the biceps slides in movements of abduction of the shoulder joint. In fact, the humerus slides along the tendon which remains relatively fixed by its attachment to the supraglenoid tubercle. If adhesions occur between the two layers of the synovial sheath of the tendon, abduction becomes limited or impossible as the tendon becomes indirectly fused to the bony sulcus. Abduction, if carried out, results in bowing of the tendon above the shoulder joint, a loop being formed which moves against the coracoacromial arch. Clinical features of this condition resemble those of adhesive capsulitis with the additional feature that supination of the arm against resistance causes pain just below the acromion. The usual manipulation carried out for an adhesive capsulitis does not result in freeing of the tendon and this condition is responsible for some of the less satisfactory results from manipulation for adhesive capsulitis. In general, the treatment should follow the lines laid down for chronic adhesive capsulitis, but once diagnosed with certainty, much the most rapid method of obtaining a cure is to expose the tendon in the intertubercular sulcus by a suitable incision and excise it from the supraglenoid tubercle to a point distal to the intertubercular sulcus where the long head of the biceps should be anchored by several chromic catgut stitches. The results of operative treatment in this condition are excellent and fully justify interference. It is wise in most cases to add an acromionectomy to excision of the tendon as more lasting results are obtained from this additional procedure.

SUMMARY

A number of common but not well understood musculo-tendinous lesions of the shoulder joint have been briefly considered. A brief outline of treatment of these conditions has been suggested.

There is no diet or essential food factor which is known to be involved in the causation of most forms of arthritis, and no diet or vitamin which so far as known can be expected to cure it. As is true of many other measures utilized in the management of disease, the diet must be adapted to the general condition of the individual patient and to the type of joint disease which he presents. A good wholesome nutritious diet is an important part of present day preventive and curative therapy.—William D. Robinson.

ASPECTS OF PERENNIAL ALLERGIC RHINITIS AND ASTHMA IN CHILDHOOD*

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THE purpose of this paper is a report of 143 cases of non-seasonal allergic rhinitis and asthma from the Out-Patient Department of the Hospital for Sick Children during the past ten years. No cases of pollen allergy alone are included. Much has been written on this subject, but little emphasis has been put on the value of specific treatment in children. Thus, a report of certain aspects of an additional series of cases would seem justified. It is felt that allergically, the upper and lower air passages are so intimately related, that cases involving the whole or parts of this tract should be grouped together. Practically all cases of asthma had allergic rhinitis and only 31 (21.7%) of the 143 patients manifested rhinitis alone.

Family history.—A family history of allergy was obtained in 61 (42.7%) cases. Of these, 32 were in the mother's family, 23 in the father's and 4 in both sides. Two were not stated. Allergy in the immediate family occurred in 20 mothers, 17 fathers and 14 siblings.

Sex.—There were 95 males and 48 females, making a ratio of 2:1. This agrees with the findings of Bray and Nelson but is a higher ratio than found by other workers as quoted by Vaughan.[1]

Associated allergies.—Forty-eight patients (33.6%) gave a history of associated allergies, chief of which was eczema which accounted for 41.

Eczema	41
Urticaria	6
Hay fever	1
Enuresis	1
Milk allergy of infancy	1
Plant dermatitis	1

Age of onset.—A study of 122 of the patients in whom definite information was obtained as to the age of onset, shows that this is essentially a malady commencing in middle childhood. Only 2 cases began under one year of age and seven under two years. In about one-half of the cases, the onset dated in the age group from

* From the Hospital for Sick Children and the Department of Pædiatrics, University of Toronto, under the direction of Alan Brown, M.D., F.R.C.P.(Lond.).

5 to 10 years. Childhood is an important time in regard to the onset. Walzer[2] states that one-third of all asthmatics have their initial attack in the first decade of life. Onset before six months is rare, but cases do occur and have been reported shortly after birth.

Skin tests.—All the patients in this series were skin tested, some receiving repeated tests. The fact that children tend to outgrow sensitivities and develop others, was so well borne out that it was felt in cases of continued allergy, that tests to be of value should be repeated at least every two years. Most certainly, common foods should be included in the tests done. As is stated by Rose[3] nasal or bronchial allergy commencing before the age of two years is most likely to be due to foods.

In childhood there is a tendency for multiple skin sensitivities. This group showed an average of 6.45 positive tests per patient. The greatest number of positives was 23. One realizes that there are individuals in which the skin may not be a sensitive organ as there were 7 cases that gave no positives. However, where skin sensitivity is present one has a definite series of allergens which may be of significance in producing symptoms in the respiratory tract. In the majority of cases the offending substance will be among these. It must also be remembered that the size of the skin test may not be significant, as an allergen giving only a one plus reaction may be more significant in regard to symptoms occurring in another shock tissue.

Of the food allergens, chocolate gave the greatest number of positive reactions, while milk was fourteenth on the list. The position of corn on this list—fourth—is of interest because it is so often used as the cereal basis for elimination diets.

In the inhalant allergens, house dust is most frequent, and this substance was found to be one of the offenders in a great many cases. This becomes important in relation to the type of heating in the home. Of 84 homes from which information was available 51 (60.7%) were heated by a hot air system. Feathers are also important allergens. In 67 homes specifying feathers in the patient's bedroom, 43 showed skin sensitivity to them by intradermal test. Tobacco also is high on the list and is a very difficult allergen to control. Such danders as cattle, hog and horse become of consequence because these coarse hairs from the abattoirs are used in making stuffing for mattresses, furniture and under rug pads.

Infection.—Removal of tonsils and adenoids was noted in 44 cases. No relationship between the severity of the allergic manifestations and the presence or absence of the tonsils was apparent in these cases. Mervish[4] states: "Tonsillectomy usually aggravates the asthma and many children actually date their asthma from a tonsil operation; this also applies to operations on the nasal sinuses." However, children with respiratory allergy stand ether anæsthesia well and it is felt that if tonsils are chronically diseased they should be removed and other foci of infection cleared up in the program for improving the patient's general health. These procedures should be carried out when the patient is allergically quiescent. Stoesser[5] in a study of 214 cases found that the majority of patients had their attacks precipitated by respiratory infections. He also demonstrated that if such individuals were controlled allergically "the acute infections were less in number and they practically were no longer able to precipitate allergic manifestations".

Treatment.—The general treatment of asthma and allergic rhinitis has been well covered in the recent literature by Rowe,[3] Glaser,[6] Ratner[7] and Detweiler.[8] The most useful drug combination in our series was that of aminophyllin, ephedrine and phenobarbital. In only three cases was nausea or vomiting encountered of sufficient degree that the drugs had to be discontinued. No other side effects were found.

The antihistamine group of drugs were very useful in the rhinitis cases and during the rhinitis stage of the asthmatic attack. At times, when they were given at the beginning of the nasal symptoms, it was felt the asthma may have been averted. Relief of the advanced asthmatic attack was not impressive and most of the benefit obtained was probably due to their mild sedative effect. Other drugs, such as ascorbic acid and dilantin sodium, were of little use other than for their psychological value.

Desensitization.—In all cases in which elimination of the allergen was not feasible, de-

sensitization was carried out. Three food asthmas were successfully desensitized by mouth.[9] This method failed in one boy sensitive to wheat. In our inhalant series where sensitivity to more than one allergen has been established or suspected, a series of inoculations have been given, using a mixed antigen. This solution has contained equal parts of house dust, wool, duck feathers and cattle hair; 48 cases were so treated. Satisfactory or complete relief was obtained in 34 of these and poor or no results in 14; 26 cases were treated with house dust alone and 19 obtained satisfactory relief. Of the 74 cases treated by inoculation satisfactory relief was obtained in 71.6%. As the extract used for preparing the test material and treatment sets was identical there was no discrepancy there. One of the most important factors in the cases that did not respond was undoubtedly failure in controlling the environment. For example, in the homes from which our patients come and with the overcrowding which has been prevalent during and since the war, it has been extremely difficult to adequately control house dust and other inhalants. In such situations there is no exact control of dosage.

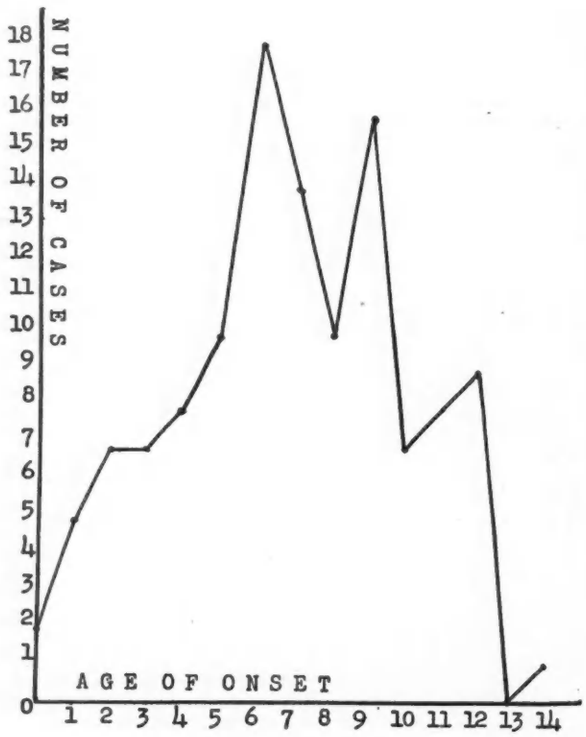

Fig. 1

Two cases that were diagnosed bacterial allergy and given autogenous vaccines failed to respond. Stoesser[5] states: "In spite of the reports of many investigations there has been no agreement as to whether vaccine therapy is of definite value in the treatment of allergic diseases of children." It is felt that more is to be gained by removal of foci of infection in the nose and throat and the allergic control of the patient than by the administration of vaccines. Thus they have been sparingly used in this clinic.

One of the most important factors in the successful treatment of the asthmatic is the proper handling from the psychological viewpoint. During the attack the patient's emotional stability is at a low ebb. His fear of being unable to breathe accentuates the severity of his asthma. He must be calmed not only by sedative drops, preferably barbiturates, but by reassurance both as to the severity of his condition and the results of treatment. The patient's family and nurse must be made aware of the effect of their behaviour, words and facial expression on him. A mother who cannot conceal her anxiety makes a very poor nurse indeed. Her demeanour must be cheerful and she must make the whole environment of the sick room so. She should avoid over-solicitation, discussion of the patient's condition in front of him or other action that will make him feel he is seriously ill. Rather she must be matter of fact and reassuring. If the home environment cannot be psychologically controlled, hospitalization should be advised.

SUMMARY

Certain aspects of a series of 143 cases of perennial allergic rhinitis and asthma are presented. Particular reference is made to hypodermic hyposensitization, using a mixed inhalant antigen. Attention is drawn to the importance of the psychological management of these cases.

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SUBACROMIAL BURSITIS*

A Classification and an Evaluation of the Results of Roentgen Therapy

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SUBACROMIAL bursitis of the shoulder and its allied disorders, tendinitis calcarea and periarthritis, have been recognized as clinical entities since the memorable work of Codman.[1] Among the many accepted forms of treatment for these conditions, roentgen therapy in the past decade has gained considerable prominence.[2 to 5] A series of 109 cases treated in the Department of Radiology, Royal Victoria Hospital, during the years 1940 to 1946 inclusive, forms the basis of the present article. During this period additional cases were treated, but have been excluded because of the lack of adequate data. In this survey a classification has been evolved which has been found to be of considerable assistance in the grouping of cases and in the assessment of the results of roentgen therapy. This classification, further, has now been adopted as a guide in the selection of cases for treatment.

CLASSIFICATION

Depending on the duration of symptoms and on the clinical findings, cases can be classified in five main groups, as follows: (1) acute bursitis—symptoms of one month or less; (2) subacute bursitis—history of one to three months; (3) chronic bursitis—over three months' duration; (4) chronic bursitis with acute exacerbation—a long and indefinite period of shoulder discomfort only, with a recent acute episode; (5) periarthritis—a lengthy history of pain and progressive loss in range of movement, and on examination a fixed shoulder with winging of the scapula on abduction.

As will be shown, for the purpose of selection of cases for treatment and the results to be expected, each group should be subdivided further on the basis of roentgenographic evidence of the presence or the absence of soft tissue calcification. Table I demonstrates the distribution of our case material as classified in the five major groups.

TABLE I.
CLASSIFICATION OF 109 CASES

Group	*No. cases*	*Percentage in series*
Acute bursitis	30	27.5
Subacute bursitis	20	18.3
Chronic bursitis	39	35.7
Chronic bursitis with acute exacerbation	12	11.0
Periarthritis	8	7.5
	109	100.0

PATHOLOGY

Codman,[1] Moseley[6] and others have used the term "rotator cuff" to describe the short rotator muscles of the shoulder girdle which insert into the greater and lesser tuberosities of the humerus. Degeneration resulting from minor repeated trauma may occur in the tendon of any of these, at or near their insertion into the periosteum of the humerus. Calcification in the degenerated tendon may be demonstrated in a proportion of cases. Such calcification, however, may be present for many years without clinical manifestation. The tendon of the supraspinatus is the most frequently involved. Symptoms seem to arise only when the floor of the overlying subacromial bursa is irritated by the degenerated or calcified tendon, thus inducing a bursitis. In long-standing cases, extra-articular fibrous adhesions may be formed with resultant marked limitation of movement—clinically known as periarthritis of the shoulder.

ETIOLOGY

The present series includes 109 shoulders presenting in 96 patients, 13 of whom had bilateral involvement. For statistical purposes, each shoulder is considered as a separate case. Of these 96 patients, 39 were males (40.8%) and 57 females (59.2%). The average age was 45 with a range of 17 to 70 years. Taking the group as a whole, 80% could be considered to belong to the non-labouring class. Among the females, however, housewives predominated. It is of interest that a history of previous moderate injury or severe unusual exertion, involving the affected shoulder, was obtained in 28%. Prior to consultation with the roentgen-therapist, 39% of the patients in this series had been subjected to one or more other forms of treatment, such as diathermy, novocain injections, hot packs, shoulder exercises and surgery.

SIGNS AND SYMPTOMS

The signs and symptoms of bursitis[1, 6, 7] of the shoulder are too well known to require a full

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description in a report of this nature. Suffice it to say that the *acute* cases complained of severe local excruciating pain, sometimes radiating down the arm and up into the neck. Objectively, local tenderness was present on pressure over the site of insertion of the involved tendon, and all movements were markedly limited because of aggravation of pain on motion.

The *subacute* group showed a clinical picture similar to the acute, but of less severity and longer duration. Several of these patients originally had had an acute onset, but their symptoms had partially subsided when first seen.

Chronic cases presented a long history of pain of a nagging character, usually associated with local tenderness over the greater tuberosity of the humerus, together with varying degrees of limitation of movement, particularly abduction and backward flexion of the shoulder.

Occasionally patients with chronic bursitis develop an *acute exacerbation,* in which the clinical picture becomes indistinguishable from the acute process. From the point of view of therapeutic management and results such cases are in a different category from the chronic case.

The patients with *periarthritis* gave the classical picture of a "frozen shoulder" with winging of the scapula on abduction and, except for minor degrees of external and internal rotation, show marked limitation of all movements.

ROENTGENOLOGIC SIGNS

Roentgen examinations in the antero-posterior projection with the humerus rotated externally and internally were carried out in each case, prior to the administration of roentgen therapy. Occasionally where the question of calcification in tendons other than the supraspinatus arose, views were also obtained in the supero-inferior or axillary projection. Calcification in the supraspinatus tendon always was seen best in internal rotation. In 65 cases (59.6%) of this series, calcific deposits were shown in the soft tissues of the shoulder. The usual site was the supraspinatus tendon near its insertion into the superior margin of the greater tuberosity (Fig. 1). In six cases, the calcium deposit was identified as lying in one or more of the remaining tendons of the rotator cuff (Fig. 2). The calcified deposits in 8 cases, however, presented a rounded lower margin which lay laterally below the tip of the greater tuberosity and therefore could not be within the tendon alone (Figs. 3, 4 and 5). It is considered that these deposits had ruptured from the tendon and extruded into the subacromial bursa. This interpretation has been confirmed in this Hospital by operation upon one of the present series and other cases. In size, the calcific shadows ranged from a tiny speck to a large mass, maximum 3.0 cm. in diameter. The smaller ones were commonly homogeneous in appearance and varying in density, whilst the larger masses were often fragmented and granular in character. Extension of the process medialward into the muscular portion of the supraspinatus was noted occasionally.

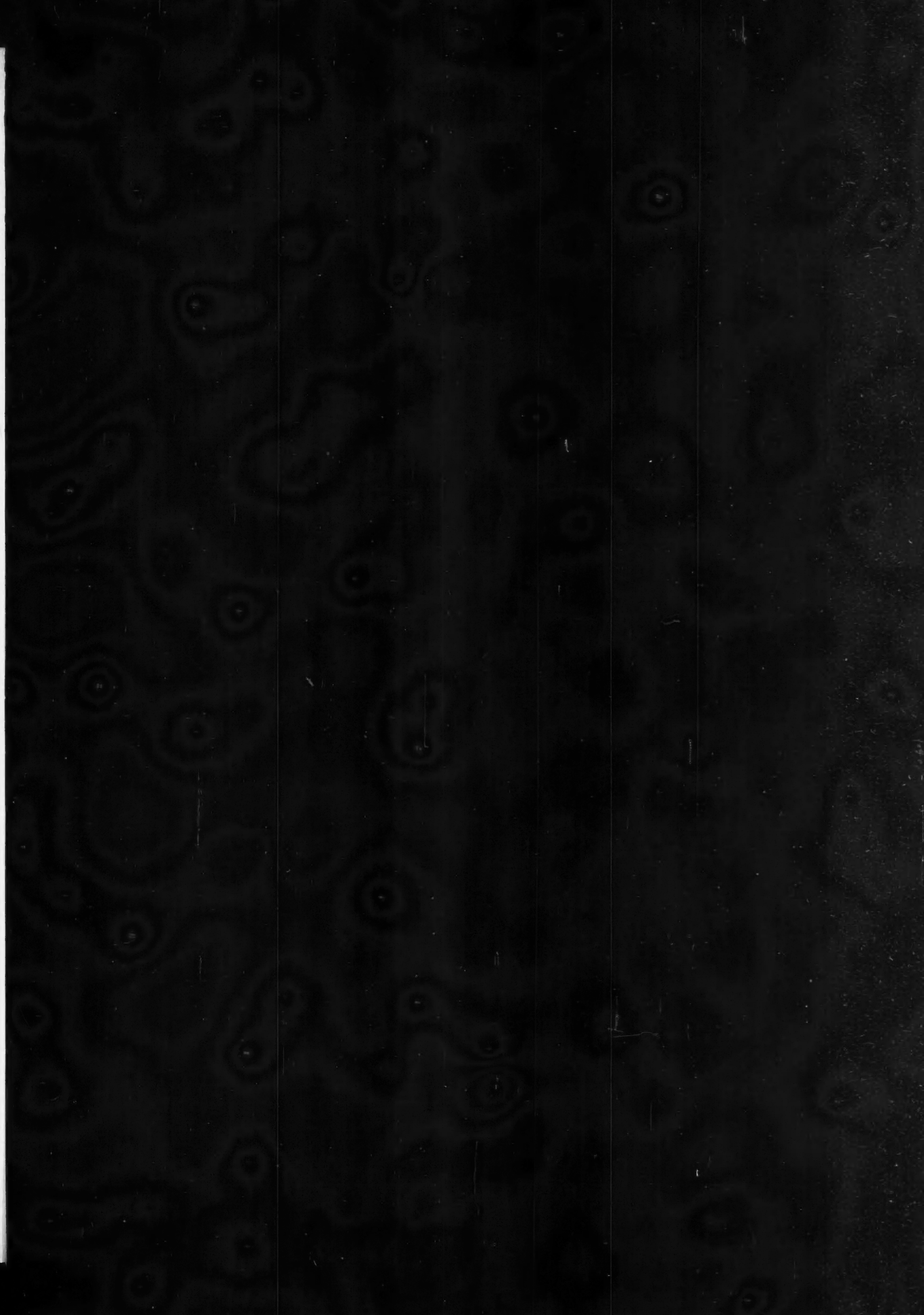
DIFFERENTIAL DIAGNOSIS

To exclude other factors producing shoulder pain, the necessity for a complete clinical and roentgenologic examination prior to institution of roentgen therapy must be emphasized. The importance of such investigation has been demonstrated by cases (not included in this series) which had been treated for bursitis on a presumptive diagnosis only. Subsequently the proper diagnosis of osteomyelitis, generalized arthralgia, or cervical spondylosis was established. Other local conditions to be considered in a differential diagnosis are minimal chip fracture of the greater tuberosity, acute arthritis, osteoarthritis of the shoulder and acromio-clavicular joints, metastatic disease of the shoulder girdle, rupture of the supraspinatus tendon and primary neoplasm. The possibility of pain referred to the shoulder from cardiac, cholecystic, pleural or mediastinal disease must also be entertained.

TREATMENT

Three different methods of roentgen therapy were employed in this series, using medium voltage in one, and high voltage radiation in the others.

1. With medium voltage, the technical factors were 135 kVP, 0.25 mm. Cu and 1.0 mm. Al filtration, 50 cm. F.S.D., H.V.L. of 6.0 mm. Al. Through a single circular field, 5 inches in diameter, centered over the greater tuberosity of the humerus, a total dose of 800-1,000 "r" measured in air was administered within 10 to 14 days, at the rate of 100 "r" per sitting. Treatments were given daily until some analgesic effect was obtained, and then on alternate days to completion. If complete relief of all



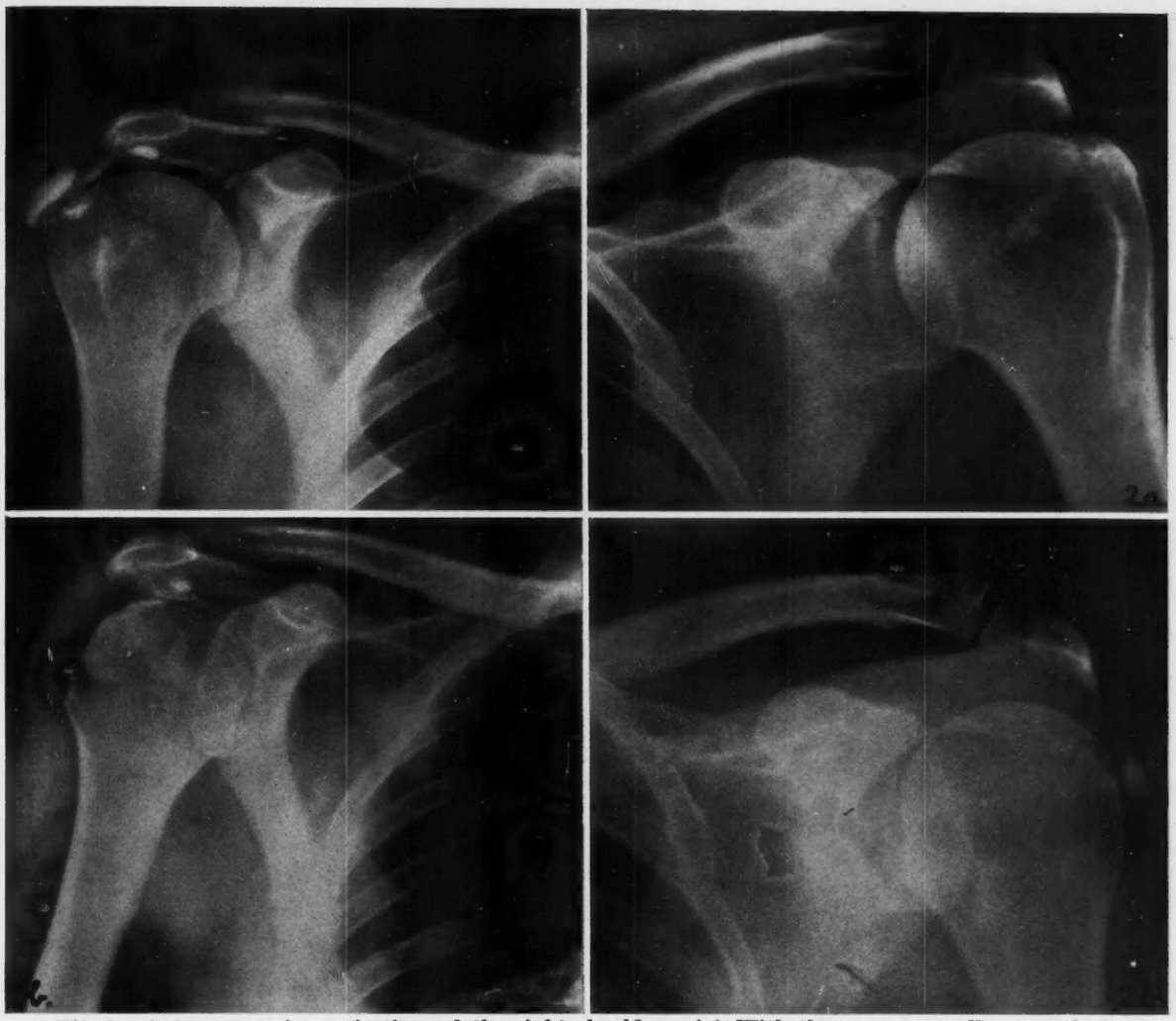


Fig. 1.—Antero-posterior projections of the right shoulder. (a) With the arm externally rotated, demonstrating extensive calcification in the supra-spinatus tendon. (b) With the arm internally rotated, the calcified deposit is still visible projected in the plane of the humeral head. **Fig. 2.**—Antero-posterior projection of the left shoulder. (a) With the arm externally rotated a dense area of calcification lies medial and slightly below the greater tuberosity. (b) With the arm internally rotated the calcified area now lies lateral to the posterior surface of the anatomical neck of the humerus and is therefore in the tendon of the infraspinatus.

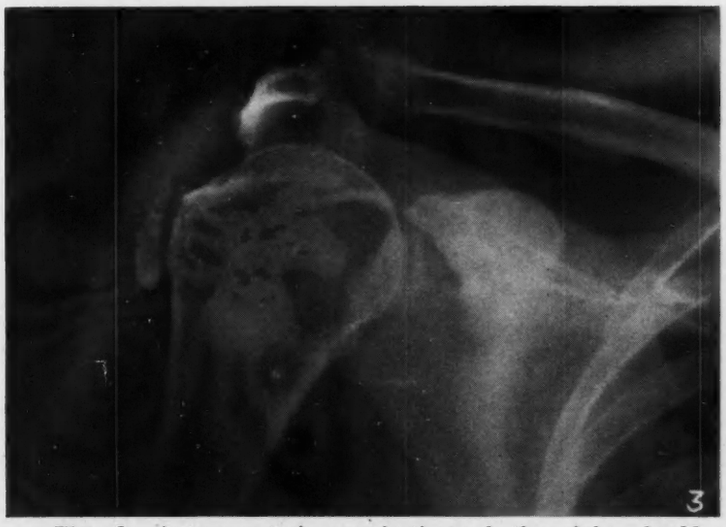


Fig. 3.—Antero-posterior projection of the right shoulder demonstrating calcium within the subacromial bursa. Note the typical tear drop appearance of the lower portion of the calcium deposit in the bursa. In addition extensive calcification is partially obscured by the humeral head but does show as a dense mottling.

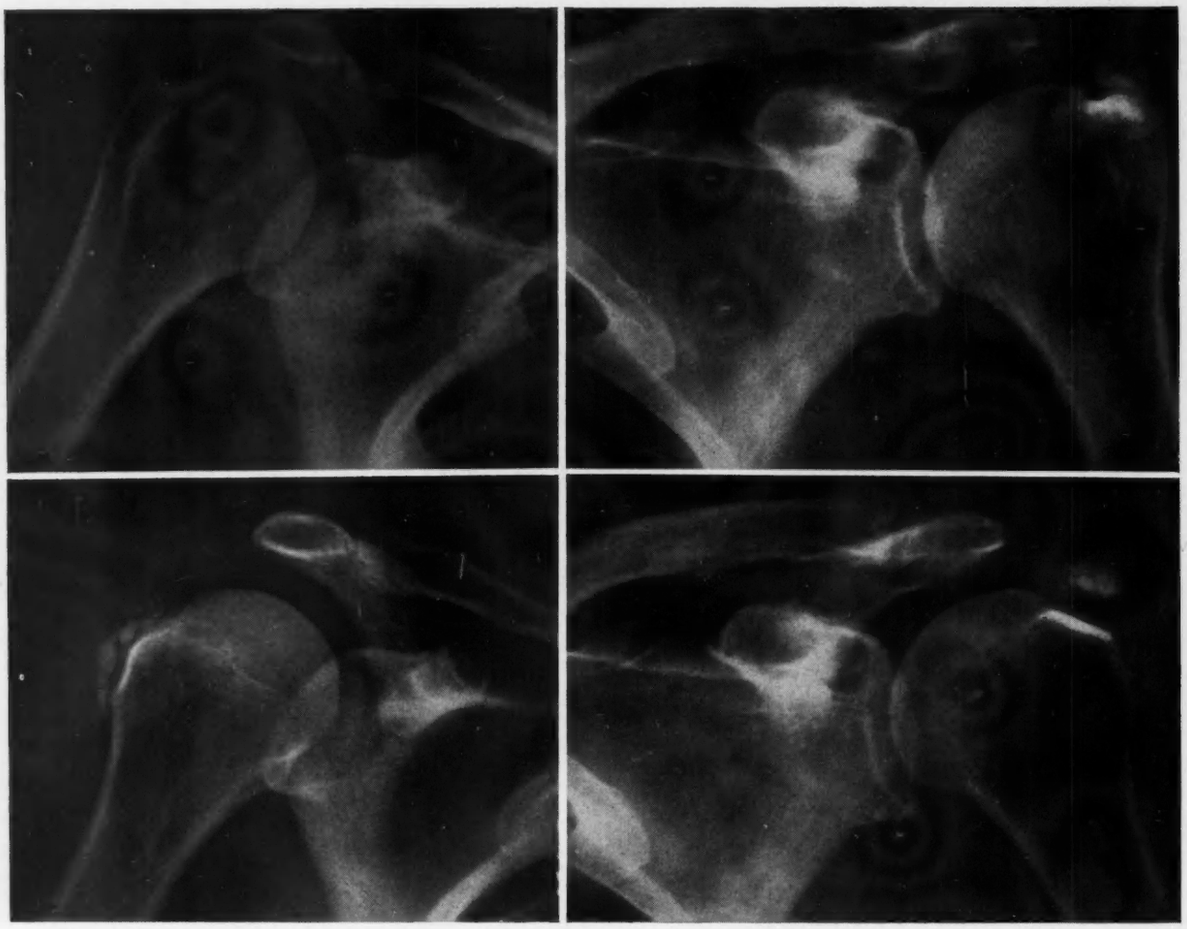


Fig. 4.—Antero-posterior projections. (a) In external rotation—calcium deposit is concealed by the humeral head. (b) In internal rotation—calcium deposit appears to be mostly in the bursa itself. **Fig. 5.**—Antero-posterior projection of the left shoulder with the arm (a) in external rotation; (b) in internal rotation. In this case both views demonstrate extensive dense calcification located in the supra-spinatus tendon together with faint non-homogeneous calcification lying lateral and inferior to the greater tuberosity, the latter indicating rupture into the bursa which then becomes outlined by the calcified deposit.

symptoms was accomplished before the end of the planned course, irradiation was discontinued. For the past two years this technique has been used routinely for the acute cases.

2. With high voltage radiation (200 kVP), either a rapid or a protracted method of administration was used, employing anterior and posterior shoulder ports 10 x 10 or 10 x 15 cm. in size. The other physical factors were 0.5 mm. Cu plus 1.0 Al filtration, 50 cm. F.S.D., H.V.L. of 1.13 mm. Cu.

(*a*) The "rapid" series comprised 3 treatments of 300 "r" (measured in air) each, over a period of 3 to 7 days. Frequently these patients demonstrated a severe recrudescence of symptoms and required codeine or occasional morphine for sedation.

(*b*) The protracted course consisted of a total dose of 1,200-1,500 "r" (measured in air) given over a period of 15 to 18 days, with an average dose per sitting of 150-200 "r". This technique has been used chiefly for the chronic cases.

It is our experience that an increase in severity of symptoms is to be anticipated a few hours following the first or the second application of x-radiation in all cases, but particularly in the acute. Adequate sedation during this stage is necesary, using acetyl-salicylic acid, plain or with small quantities of codeine. Rarely is morphine required. All patients are encouraged to begin systematic active exercise of the shoulder as soon as moderation of pain permits.

RESULTS OF ROENTGEN THERAPY

The results of therapy have been assessed in the present series on the basis of the immediate response at completion of the therapeutic course, and upon the status of the patient, six

months or more after the completion date, as determined by follow-up examination.

1. *Immediate results.*—These are tabulated in Table II. The acute and subacute bursitis, on the whole, responded well to roentgen therapy, confirming the results previously reported by several workers.[2, 3, 4] The analysis illustrates, however, that acute and subacute cases without calcification did not react as well as those with calcification. A critical re-survey of these cases fails to explain the poorer results. Hence, prior to accepting such patients for treatment, a very careful scrutiny of those patients who have no demonstrable calcification in the shoulder must be made, to ensure a proper diagnosis, and this is now the policy in this Department. Half the chronic group responded favourably whether calcification was present or not. On the other hand, it is notable that chronic cases with an acute exacerbation of symptoms did almost as well as the acute group with calcification.

The results of treatment of periarthritis were generally disappointing, only one patient out of eight having shown moderate response.

TABLE II.
IMMEDIATE RESULTS OF ROENTGEN THERAPY
109 CASES

Group	*No. cases*	*Complete relief*	*Marked relief*	*Partial relief*	*No relief*
Acute Bursitis		*Percentage*	*Percentage*	*Percentage*	*Percentage*
(*a*) With calcium in tendon	19	73.7	21.1	5.2	
(*c*) No demonstrable calcium in tendon	11	27.3	36.4	27.3	9.0
Subacute Bursitis					
(*a*) With calcium in tendon	9	33.3	55.5		11.2
(*b*) No demonstrable calcium present	11	18.2	36.4	27.2	18.2
Chronic Bursitis					
(*a*) With calcium in tendon	22	4.5	54.5	27.0	13.0
(*b*) No demonstrable calcium present	17	5.8	47.0	11.8	35.4
Chronic Bursitis with Acute Exacerbation					
(*a*) With calcium in tendon	10	50.0	40.0	10.0	
(*b*) No demonstrable calcium present	2	50.0		50.0	
Periarthritis					
(*a*) With calcium in tendon	5			20.0	80.0
(*b*) No demonstrable calcium present	3		33.3	33.3	33.3

Complete relief.—No symptoms, no limitation of movement.
Marked relief.—Occasional ache, very slight limitation of movement, slight inconstant local residual tenderness.
Partial relief.—Residual ache, commonly inconstant, limitation of movement (partial).
No relief.—Unchanged.

RELATION OF IMMEDIATE RESPONSE TO METHOD OF IRRADIATION

An assessment of the immediate results on the basis of the method of irradiation has shown that the acute cases and also the chronic cases with exacerbation of symptoms, definitely appeared to do better when medium voltage (135 kV) radiation was used. Although it has been our general policy to use 200 kV radiation in treating the obese and the chronic cases, no major difference in results was noted in the chronic cases treated with 200 kV as compared with the small group of chronic cases treated with the 135 kVP technique.

The response in the acute and subacute groups to the "rapid" form of administration at 200 kVP was not quite as good as that noted with the more protracted 135 kV method. In the chronic group, however, the response to the "rapid" method appeared to be somewhat better than with the protracted form of administration at 200 kV. The latter findings cannot be regarded as overly significant at this time owing to the relatively small number of cases in this group.

2. *Final results.*—In Table III are listed the final results in 56 cases followed for six months or more during the period 1940-47.

Generally, in the acute and subacute groups, the satisfactory immediate results lasted, whereas in a small percentage of the chronic ones, after an initial improvement, a relapse occurred. In many of the chronic cases, although pain had been relieved, improvement in range of motion of the shoulder was delayed and inadequate. It is our belief that much of this was due to insufficient early supervised exercise. Consequently, in all patients, as soon as partial relief of pain has been secured, supervised active exercises of the shoulder should be initiated, particularly abduction and external rotation, and persisted with as long

as any limitation of movement remains. By this method, we feel that a more satisfactory end result may be expected in the subacute and chronic groups.

Four cases (three chronic bursitis, one periarthritis) had an acute recurrence of symptoms. After a further course of roentgen therapy one of the chronic cases gained complete relief, but the case of periarthritis failed to improve. The second chronic case had complete relief after surgical evacuation of the bursa. The third improved gradually on a course of active shoulder exercises.

An effort has been made to determine the ultimate fate of the calcium deposits. Follow-up roentgen examination, at varying intervals from 6 months to 7 years, in 12 of the treated cases with known calcification about the shoulder demonstrated complete resolution in 6, and marked diminution in the degree of calcification in 3 others. Two cases remained unchanged. One demonstrated an increase in the amount of calcium. Any attempt to determine whether or not calcification has disappeared after x-ray therapy requires roentgenograms not only in the ordinary antero-posterior projections, but also with external and internal rotation of the humerus.

TABLE III.
FINAL RESULTS OF ROENTGEN THERAPY
FOLLOW-UP ON 56 CASES, 6 MONTHS OR MORE AFTER IRRADIATION

Group	*No. cases*	*Complete relief*	*Marked relief*	*Partial relief*	*No relief*
Acute Bursitis		*Percentage*	*Percentage*	*Percentage*	*Percentage*
(*a*) With calcium in tendon	9	100.0			
(*b*) No demonstrable calcium in tendon	4	50.0	25.0	25.0	
Subacute Bursitis					
(*a*) With calcium in tendon	5	60.0	20.0		20.0
(*b*) No demonstrable calcium present	4	25.0			75.0
Chronic Bursitis					
(*a*) With calcium in tendon	12	25.0	25.0	8.0	42.0
(*b*) No demonstrable calcium present	8	25.0	12.5	12.5	50.0
Chronic Bursitis with Acute Exacerbation					
(*a*) With calcium in tendon	7	57.0	43.0		
(*b*) No demonstrable calcium present	2	100.0			
Periarthritis					
(*a*) With calcium in tendon	4		25.0		75.0
(*b*) No demonstrable calcium present	1				100.0

SUMMARY AND CONCLUSIONS

A classification of subacromial bursitis, which is of value in selecting the cases suitable for roentgen therapy and in estimating the prognosis has been described.

In the selection of cases for roentgen therapy and in the evaluation of the immediate and late results, a careful clinical and radiologic examination is a necessary pre-requisite. Roentgenographically demonstrable calcium in the soft tissue seems to have a direct relationship to prognosis. Calcification, if present, usually is situated in the tendon alone, not in the bursa. The presence of a calcified deposit in the subacromial bursa may occasionally be demonstrated. Its typical tear-drop outline and site have been described.

Acute and *subacute bursitis* respond favourably to roentgen therapy. However, this survey has shown that in the absence of calcification, the response is not as satisfactory as when calcification is demonstrable. *Chronic bursitis* with acute exacerbation of symptoms may be expected to respond almost as well as the acute form.

Long standing *chronic bursitis* may be relieved considerably, but to a lesser degree.

In *periarthritis,* roentgen therapy is not recommended.

In all cases, as soon as sufficient relief from pain has been accomplished, active supervised exercises of the shoulder should be instituted and persisted with until complete range of movement is obtained. This particularly applies to the chronic cases.

Disappearance or marked diminution in the amount of calcification after roentgen therapy seems to be the rule in the limited number of cases followed.

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MODIFIED DENIS BROWNE OPERATION FOR HYPOSPADIAS

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THE literature on hypospadias is so extensive that it would serve no useful purpose to review all of it in detail here. In 1931 Cecil[1] listed over 550 titles and Godard[2, 3] summarized many of the procedures described up to 1937. Since then, many more articles have appeared and several new operations have been outlined. Padgett and Stephenson[4] give an excellent review of these.

While this defect was known to the ancients, Dieffenbach[5] is given credit for being the first to attempt to relieve it in 1836 by tunnelling the penis and hoping for canalization. Since this crude unsuccessful effort, surgery has followed many lines, several of which have been unproductive and have been discarded. Others have been modified and gradually brought to a higher state of refinement. Anger[6] performed the first successful operation in 1874 using a method suggested by Thiersch[7] in 1869 for epispadias. That the problem is not easy is shown by the multiplicity of attempts which have been made to solve it.

To understand the problem it is necessary to break down the defect into its component parts. The obvious lesion is the congenital absence of a portion of the urethra so that the meatus does not open on the glans penis, but falls short to an extent varying in the balanitic, penile, scrotal and perineal types. The corpus spongiosum is also deficient and is represented by fibrous tissue extending from the misplaced meatus to the under surface of the glans. This fibrous tissue contracts, resulting in secondary curvature of the body of the penis. This organ may also be smaller than normal. The prepuce is usually present as a hood on top of the glans.

Depending on the degree of involvement, the patient has difficulty in voiding normally, in intercourse and in insemination. Superimposed on these physical complaints may be added emotional stress due to embarrassment. Proper treatment depends on the recognition of these component parts and consists of three phases: (1) correction of chordee; (2) construction of a new urethral tube; and (3) endowing this with a skin covering.

The absolute necessity of relieving the curvature was recognized early. This was accomplished first by subcutaneous section, later by open section and finally by complete removal of the fibrous remnants of corpus spongiosum. This is usually advised as a separate procedure but can be included as part of another operation (Pettit,[8] Mettauer,[9] Bouisson,[10] Duplay,[11] Humby[12]). When this fibrous tissue is removed and the penis straightened, the meatus is often displaced towards the perineum, temporarily increasing the patient's disability. Some actually advocate transplanting the meatus still further back to avoid the thinned-out coverings.

Beck,[13] impressed by the normal elongation of the urethra during erection, transplanted the urethra forwards in 1897. This could be successful only in the simplest cases and usually failed because it resulted in downward curvature. Dieffenbach[5] merely tunnelled the penis, others provided a lining by using a vein, artery, the ureter or the appendix. Nové-Josserand[14] in 1897 used a free skin graft. Unfortunately this was not successful because of narrowing of the lumen and shortening in length which resulted from shrinkage of the graft and failure to grow as the organ grew. McIndoe[15] in 1937 tried to overcome the difficulty of inserting the graft by devising a special instrument. He hoped to prevent shrinkage by insertion of a sound for several months. Humby[12] in 1941 described a one-stage operation by which the penis was straightened by excision of the scar tissue and then split or "kippered". A split skin graft was wrapped around a catheter and placed in this groove and the penis was then sutured again.

Ombrédanne[16] in 1911 perforated the prepuce and brought it underneath the glans to form a covering for the urethra constructed from skin on the under surface of the organ. Mayo[17] in 1901 raised a flap from the dorsum of the penis and prepuce, formed a tube with its base at the corona and inserted it into a tunnel from the glans to the misplaced meatus. Davis[18] recently modified this by raising a flap from the prepuce and dorsum of the penis and making a tube with the base attached at the root of the penis, thus maintaining a better blood supply. He then perforated the penis from the glans to the misplaced meatus, bent this structure backwards and inserted this tube into the newly prepared bed.

Numerous procedures have been devised in which the urethra or at least its floor was formed by skin from the scrotum or abdomen. These have been discarded because of the complication of hair growing into the urethra, resulting in stone formation in some cases. Cabot[19] in 1936 modified Bucknall's[20] operation to avoid these complications.

Early in the evolution of the surgical treatment of hypospadias, flaps from the penis itself were used to form the urethral tube. Thiersch,[7] Duplay[11] and Cecil[21] developed an operation which has gained much support. In this operation a urethral tube is made from a broad flap of penile skin and this tube is then covered by another flap of penile skin in such a way that the two suture lines are not superimposed and that the danger of leakage at the old urethral orifice is lessened. It will be noted that the problem in these cases is that, when sufficient skin has been used to form a urethral tube, it is difficult to obtain enough to form a covering without undue tension.

Edmunds[22] in 1926 utilized the prepuce, button-holing it to form a double-ended tube graft. Later this was divided in two and then split open and transplanted under the penis, thus giving enough tissue to form a tube and covering by the Duplay method.

In 1945 a man aged 22 years consulted me because of hypospadias of the penoscrotal type. The penis was short and curved but otherwise very well formed with a hood of preputial tissue. In December, 1945, the contracted fibrous tissue was removed and the curvature straightened. This resulted in the meatus being displaced towards the perineum increasing, for the time being, the difficulty in urination. After suprapubic drainage the Thiersch-Duplay-Cecil operation was performed in December, 1946, with excellent initial results. It was not possible, however, to control his erections and the suture line did not hold. The procedure was repeated in January, 1947, using heavier sedation but the operation failed again for the same reason. It then occurred to me that if a flap could be formed from the prepuce and inserted into an incision along the dorsum of the penis, more tissue would be provided and the operation could be completed without tension. In March, 1947, with this object in mind, an incision was made along the dorsum of the penis from the root to the corona. Transverse incisions about 1" in length were made at either end of this longitudinal incision. The short broad penile flaps were turned in laterally leaving a rectangular bare area on the back of the penis. The preputial hood was now stretched out and incised at the edges and split. The resultant rectangular preputial flap was raised and pulled up to the root of the penis and sutured into the area. The subcutaneous tissue was lax and little actual undercutting was necessary. Firm pressure was applied to this flap by tying sutures on one side to sutures on the other side over dressings as is often done in other plastic procedures. This flap healed without loss and the Thiersch-Duplay-Cecil repair was then completed in November, 1947, without difficulty.

In reviewing the literature later I found that Denis Browne[24] in 1936 had described a similar operation. He used a dorsal incision and a pointed flap without the proximal transverse incision. It is felt that the present operation affords greater relaxation along the entire length of the organ and may therefore have some advantage where small amounts of tissue may mean so much (Figs. 1 and 2).

Most authors stress the need for complete diversion of the urinary stream, either by suprapubic cystostomy or perineal drainage either through the misplaced meatus or a new perineal opening. Some even advocate passing a temporary ligature over the distal portion of the urethra to ensure that not a drop of urine passes. It is interesting to note that Edmunds and Brown contend that diversion of the stream is unnecessary and that a tube left in

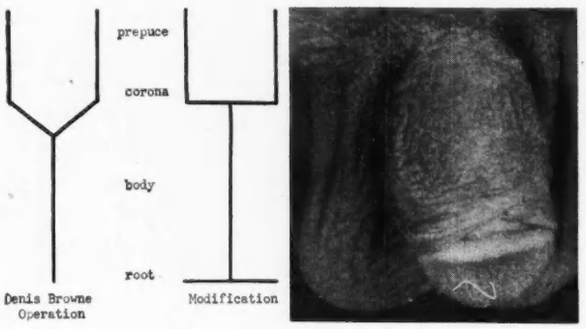

Fig. 1

Fig. 2

Fig. 2.—Dorsum of penis showing insertion of broad preputial flap. The suture lines are visible along the base and lateral borders of the penis. This demonstrates how much additional tissue is now available for the final operation.

the new formed urethra is an irritant delaying healing. In the final operation in my case a urethral catheter was inserted but did not drain well and was removed in 24 hours. The postoperative course was smooth throughout.

Edmunds[23] and Davis[18] describe operations for repair of small openings which may occur in the newly constructed urethra.

SUMMARY

The prepuce is a useful cache for much needed tissue. Hypospadias can be treated by excision of the fibrous contracting bands and the insertion of a flap of prepuce into the dorsum of the penis to provide more skin. At a second stage the Thiersch-Duplay-Cecil operation can then be completed without tension. The diversion of the urinary stream does not

appear to be as important a factor in healing as the relaxation of the suture line afforded by the insertion of this additional tissue.

After reviewing the various types of operations for hypospadias we conclude that the most satisfactory material available is either the penile skin or the prepuce. The Thiersch-Duplay-Cecil operation offers a direct approach. The chief problem is lack of tissue. With the insertion of the preputial flap this difficulty is eliminated.

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A SURVEY OF SIXTEEN CASES OF MALIGNANT MELANOMA OF UVEAL TRACT*

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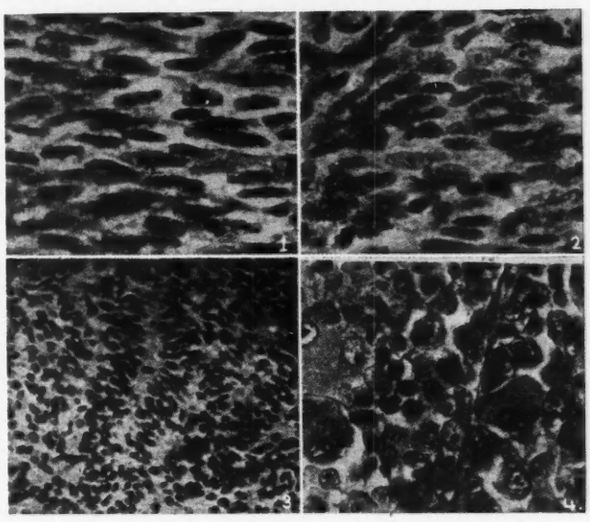
SINCE 1941, 18 cases of new growth involving the interior of the eyeball have been treated in the Eye Department of the Montreal General Hospital. Of these, 16 have been malignant melanomas of the uveal tract. One has been a carcinoma secondary to a hypernephroma. Another has been a retino-blastoma in a child. This discussion will be limited to the 16 cases of malignant melanoma, forming a continuation of the previous report made on the same subject by the late Dr. S. Hanford McKee in 1941. As regards incidence, Dr. McKee made the observation at that time that it was a relatively rare disease, and quoted Stallard's figures, giving an incidence of one malignant melanoma to 4,000 cases. This comparative rarity of the disease would appear to be borne out in the present study, which shows that during the period in which these 16 tumour cases came under observation 36,388 new cases were seen by the staff of the Department of Ophthalmology at the Montreal General Hospital, or one case of malignant melanoma to 2,271 new cases.

Classification of the tumours were made on a basis of cellular formation and reticulum content, following the outline of G. R. Callender, whose description and diagram is as follows;

Spindle A.—Spindle shaped cell with a narrow oval nucleus and indistinguishable or ill defined nucleolus (Fig. 1).

Spindle B.—Spindle shaped cell in which the nucleus is oval but generally more robust than the spindle A nucleus. There is a prominent nucleolus (Fig. 2).



Fascicular.—The term describes the palisaded arrangement of the cells rather than their morphology. The cell resembles the Spindle B (Fig. 3).

Epithelioid.—Round or polygonal cells usually rather large but with considerable variation in size and shape. Nucleus is round and nucleolated. Cytoplasm is abundant, usually homogeneous and markedly acidophilic (Fig. 4).

The fibre classification is based on the relative content of argyrophil fibres as demonstrated by the Wilder reticulum stain.

Heavy.—Tumours having in all areas fibres forming a network about individual tumour cells (Fig. 5).

Marked.—Tumours having a definite preponderance of areas containing fibres—fibre content more than 50%.

Medium.—Tumours having areas with and without fibres approximately equal—fibre content about 50% (Fig. 6).

Light.—Tumours having a definite preponderance of fibreless areas—fibre content less than 50%.

At the time of the report made by Dr. McKee in 1941, estimation of the reticulum content had not been made at this hospital, so that when the present survey was begun, it was necessary to go back over the years to 1941 and secure the original blocks and restain for fibre con-

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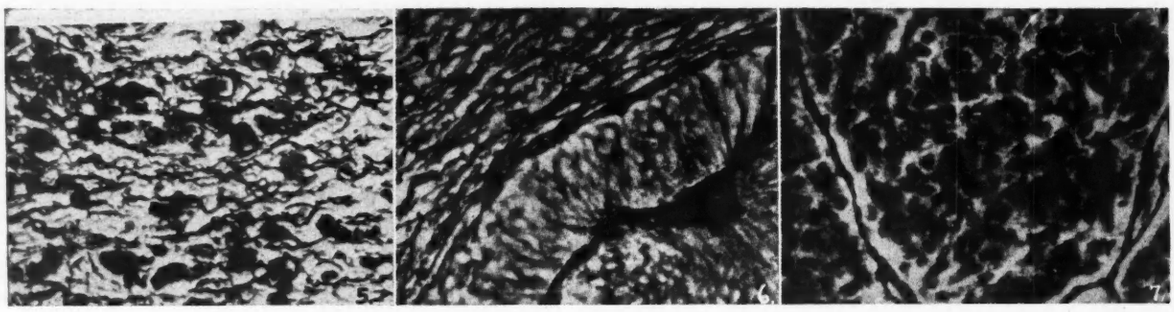
tent. It would seem that this method combined with the original classification of cell types may provide a more accurate clue as to the eventual prognosis.

Of the 16 cases here recorded 11 were females and 5 were males.

Age incidence was as follows:

	Cases
Under 20 years	1
20 to 29 years	1
30 to 39 years	2
40 to 49 years	3
50 to 59 years	5
60 and over	4

An attempt will be made to group the cases, particularly with reference to clinical symptoms and signs, and giving a general indication of the progress of the disease with reference to the time element.



Clinical features.—Two cases were detected at routine examination of the eyes for glasses—patients had had no special complaints.

The 14 remaining cases all noted some disturbance of vision as a first complaint and in those cases which did not seek medical assistance this loss of vision went on to eventual blindness. The average length of time required for this was eight months although there was a wide variation in many of the cases. In these cases which had not been seen early this loss of vision was almost invariably followed by pain and tenderness of the eye as a final event; which in all cases forced the patient to seek relief.

Clinical examination. — Four cases showed lesions of the eye which were grossly visible and are recorded as follows:

A case of proptosis of the eye. This eye had been blind for 12 years, the lens was dislocated and cataractous at time of examination. Transillumination of globe was poor. No view of the fundus was possible. The eye had recently become very painful. At operation an extra-ocular mass was found, which on rush section was found to be a malignant melanoma. Because of this an exenteration of the orbit was carried out. Patient is now six years postoperative and is still alive and well.

Two cases showed dark brown masses subconjunctivally at a distance of 5 and 8 mm. posterior to the limbus. One mass was in the upper nasal quadrant and the other was in the lower temporal quadrant of the eye.

Finally, one case showed a black raised mass 3 x 4 mm. on the iris which projected forward into the anterior chamber at the 5 o'clock position.

The above four cases therefore presented actual visible lesions of the eye that could be seen from the exterior and taken together with the pertinent history would indicate the strong possibility of a tumour being present.

The remaining 12 cases did not show any grossly visible lesion of the eye as seen from the exterior. In 7 of these 12 cases it was possible by ophthalmoscopy to see a mass either projecting into the vitreous and detaching the retina with it, or, as occurred in one case, arising from the ciliary body close behind the iris and growing across behind the pupillary area and involving the posterior surface of the lens.

In the remaining five cases it was not possible to view the interior of the eye due to: (1) Corneal œdema. (2) Bullous keratitis. (3) Cataractous changes in the lens. (4) Exudate on the anterior surface of the lens. (5) Heavy vitreous opacities.

In this group of five cases the duration of the complaints ranged from nine months to three and one-half years before they came under observation at this Clinic. All suffered from complete loss of vision and painful eyes, the interior of which could be not be seen. In view of the possibility of the intraocular tumour being present and in the absence of a definite history of trauma enucleation was advised. In all five cases of malignant melanomas were found on pathological examination.

In the previously mentioned group of seven cases in which the interior of the eye was visible by ophthalmoscopy, five revealed a suspicious tumour-like mass involving the coats of the eye and protruding into the vitreous cavity. In two cases the retina was detached over the tumour and at first examination the

tumour was not visible; however, rest in bed with both eyes covered permitted the retina in one case to reposit itself enough so that a mass was visible beneath it. In the other case the retina did not reposit and diagnosis of tumour was made on other findings, the most important of which was failure of the area involved to transmit light. This failure of transillumination over the involved area together with other signs and symptoms such as loss of vision, painful eye, increased intraocular tension and displaced retina was taken as strong indication of tumour being present.

Ten of the 16 cases eventually developed an increased intraocular tension which ranged from 56 mm. to 100 mm. Schiotz. In four cases the intraocular tension was reported normal. Two cases did not record whether or not the tension was elevated.

Pathological findings.

	Cases
Spindle A	4
Spindle B	6
Fascicular	3
Epithelioid	3

Reticulum content.

Light	4
Medium	8
Heavy	2
Unclassified (In these two cases the original blocks were not available to stain for reticulum content).	2

Progress of cases.—Of the 16 cases here reported who have had an eye enucleated because of malignant melanoma, 13 are alive and well and show no signs of metastases at this time. Three are dead. One died from what, there is good reason to believe, was a cerebral accident at the age of 78, three years after enucleation. No postmortem was obtained. Pathological classification had been Spindle B with medium reticulum content. One died at the age of 64 years, one year after enucleation. In this case postmortem showed a melanotic tumour mass of the liver. The original pathological classification had been the epithelioid type of tumour with light reticulum content and a heavy melanin content. The third case died at the age of 60 years, 2 years after enucleation, of a large mass of the liver which on postmortem examination was found to be a melanotic tumour. Original pathological classification in this case was Fascicular type with a medium reticulum content and a moderate melanin content.

Examination of the globes revealed that the tumours originated as follows:

	Cases
Choroid	11
Ciliary body	3
Iris	1
Uncertain (Either iris or ciliary body. Probably ciliary body.)	1

No extension to the optic nerve was found in any of the 16 cases, even including the three cases with extraocular extension previously mentioned in which exit from the globe was traced through the emissary veins or ciliary nerves. In no case, to date, has local recurrence taken place in the orbit. One of the most interesting cases in this series is one that was mentioned by the late Dr. McKee in his report in 1941 and which has since been followed up.

This male patient first noted a diminution of vision in his right eye in 1923, he was then 37 years of age. A malignant melanoma of the choroid was diagnosed, but enucleation was refused by the patient. By 1936, 13 years later, complete loss of vision of the right eye had occurred. In 1941 severe pain developed in the eye and he again consulted an ophthalmologist. By this time it was not possible to view the interior of the eye due to cataract formation, posterior synechiæ and bullous keratitis. However as the eye was blind and painful with an intraocular tension of 60 mm. Schiotz and with a definite history of tumour, the eye was enucleated. At operation no evidence of extraocular extension was found. Pathological examination showed it to be a Spindle A with a heavy reticulum content. No note was made of the melanin content. Patient is now 62 years of age and is alive and well, seven years postoperative. This case may possibly lend support to the feeling that is beginning to prevail that a Spindle A with heavy reticulum content offers the best prognosis.

CONCLUSIONS

One of the earliest symptoms of malignant melanoma of the choroid is disturbance of vision. The complaint was present in 14 of 16 cases of this series. This may make itself manifest by: blurring of vision; spots before the eye; scotoma formation.

At this time the tumour mass may be visible with the retina elevated above it, or the retina may be detached and the tumour hidden beneath it. In the latter case an attempt will be made to reposit the retina by rest in bed and transillumination both objective and subjective may be employed in an attempt to reveal the true cause of the detachment. As the case progresses other signs and symptoms make themselves apparent with: (*a*) Continued loss of vision progressing to total blindness. This may be a matter of a few months or many years. Average time eight months. (*b*) Pain and discomfort in the eye which in this series

of cases appeared to be caused by: (1) Increased intraocular tension. (2) Iridocyclitis probably caused by toxins from the tumour itself. (*c*) Further signs such as keratitis, cataract formation and vitreous opacities eventually develop. (*d*) Evidence of extraocular extension. This may not necessarily be one of the latest signs and would appear to be governed to a great extent by the original location of the tumour.

In those cases not seen early, a period of from nine months to seventeen years was necessary before the onset of pain forced the patient to seek or accept surgical relief.

As regards prognosis the small number of cases in this series does not permit of any definite conclusions being drawn. However, it does agree with the generally accepted belief that Fascicular and epithelioid types with a low to medium reticulum content have a poorer prognosis than a Spindle type with a heavy reticulum content.

The writers desire to acknowledge the great assistance provided by Drs. J. Pritchard and W. Matthews of the Department of Pathology, who reviewed the specimens, and of Miss Dorine Slessor who helped with the preparation of the reticulum content slides.

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SUBAORTIC STENOSIS IN AN ADULT*

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SUBAORTIC stenosis of the left ventricle is one of the rare types of heart malformation. Walsh, Connerty and White[5] found no instance of this anomaly in more than 10,000 autopsies at the Massachusetts General Hospital. Wiglesworth[7] in a review of the literature up to 1937, found only 36 cases, to which he added one other. Since that time Walsh, Connerty and White[5] reported one case; Grishman, Steinberg and Sussman[12] added another; and Gruenwald[14] recently reported six additional cases.

In many instances the subaortic stenosis has been sufficiently severe to produce circulatory signs and symptoms, and presumably was responsible for cardiac failure and death. In other cases superimposed bacterial endocarditis at this site has led to fatal outcome. In this respect, it is interesting to note that two of Gruenwald's[14] cases died of causes not related to the malformation, and a review of the literature indicates that this condition is compatible with longevity. Gruenwald[14] has suggested that in all probability, a large number of cases produce no symptoms, and this malformation may be more common than has generally been supposed. On the basis of the case to be reported, it would appear that symptoms referable to this malformation may appear relatively late in life.

CASE REPORT

A 51-year old white female was first seen in the Outpatient Department of the Jewish General Hospital on November 19, 1947. Her chief complaints were "weakness" and "shortness of breath". She gave a history of having been completely well up until the age of 35. At that time she began to develop dyspnœa on exertion and this had grown progressively more severe during the past four to five years. Apart from occasional attacks of what the patient termed "bronchitis" during the winter months, there were no other complaints or symptoms. The patient denied having had rheumatic fever or scarlet fever, and the rest of the past history and family history was irrelevant.

On examination, the blood pressure was 135/80. The heart was enlarged to the left to percussion. The rate was regular with occasional extrasystoles. The first sound was followed by a loud, rough systolic murmur heard over the whole precordium, which was loudest over the aortic area. The aortic second sound was louder than the pulmonic second. Coarse râles were heard over the base of the right lung. The liver was not palpable, but was percussed to two fingerbreadths below the right costal margin. *Impression* was mitral insufficiency and aortic stenosis on a rheumatic basis. The electrocardiograph taken two days later was interpreted as showing left ventricular strain and enlargement, of a type associated with aortic stenosis. A seven foot heart plate taken on November 27, was interpreted as that of a mitral valvular lesion in the stage of decompensation. Pleural effusion was present on the right side. Blood Wassermann was negative.

The patient was admitted to the hospital on December 30. Her weakness and shortness of breath were now more severe. There was some pharyngitis. The heart findings were as previously noted. Blood pressure was 118/72. The pulse rate was recorded as 126. Moist râles were heard at both lung bases. The liver was palpable three fingerbreadths below the right costal margin and there was generalized abdominal tenderness. Both lower extremities showed marked pitting œdema. No cyanosis was noted at any time. Hæmoglobin was 62% and the white blood count was 7,600.

On January 2, the patient began to complain of palpitations. Her condition was essentially the same. Tachycardia was still present, the rate being 108. The fluid in the right chest was increasing. On January 3, thoracentesis was performed on the right side and 700 c.c. of blood-tinged, yellow fluid was removed. This was repeated four days later and an additional 400 c.c. of yellow fluid was removed. By January 10, the patient was exteremely uncomfortable and dyspnœic, and complained of chest pain. Auricular fibrillation was first noted on this day, with a heart rate of 92. Urinary

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output was very poor. There was impaired resonance and absence of breath sounds over the right lung base. On January 12, thoracentesis was again performed and 650 c.c. of fluid removed from the right chest which proved to be sterile upon culture. Auricular fibrillation was still present with a rate of 96 to 112. By January 16, dyspnœa had become very severe and the patient was kept continuously in an oxygen tent. Liver enlargement was more marked and abdominal tenderness severe. The next morning the patient quietly expired.

Clinical diagnosis.—Rheumatic heart disease with aortic stenosis and mitral insufficiency. Cardiac enlargement and congestive heart failure. Terminal auricular fibrillation.

Autopsy.—Autopsy was performed twelve hours after death. No significant external abnormalities were noted. The right thoracic cavity contained 100 c.c. of slightly turbid, straw-coloured fluid. The lungs were mottled greyish-pink and black in colour, and were bound in many situations to the adjacent thoracic walls by dense pleural fibrous adhesions. The pericardial sac contained 75 c.c. of clear pale yellow fluid.

Fig. 1.—Photograph showing thick, elevated, subaortic fibrous ridge across interventricular septum. Note arcades with downward facing mouths at lower edge of band. Chordæ tendineæ of mitral valve are not appreciably thickened. The aortic valve leaflets are unaltered.

The *heart* weighed 580 gm. The right chambers and the valves of the right side of the heart were normal. The foramen ovale was sealed. The left auricle was lined by somewhat opaque, greyish-white endocardium. The mitral valve leaflets were slightly thickened and wrinkled, but were normal in all other respects, showing no evidence of fusion or retraction. The chordæ tendineæ were discrete and not shortened, although they showed occasional slight thickening at the point of valve attachment.

The left ventricular wall was markedly hypertrophied, measuring 19 mm. in thickness. In most situations, the endocardium lining the ventricle was smooth and glistening. In the region of the aortic vestibule and over the upper portion of the interventricular septum, the endocardium was distinctly thickened, greyish-white and opaque. At a distance of 2 to 4 mm. below the base of each aortic valve cusp, extending across the entire upper portion of the interventricular septum, was a thick, elevated band of greyish-white fibrous connective tissue which measured 2.5 cm. in width. The lower edge of this band formed several small, somewhat irregular, arch-like pockets which faced downwards and were raised 1 to 2 mm. above the adjacent endocardium (Fig. 1). In addition (Fig. 2), there was present a distinct bulging of the myocardium of the interventricular septum, into the outflow tract of the left ventricle, which further accentuated the stenosis produced by the above described ridge. The aortic valve ring was not narrowed, and the aortic valve leaflets were for the most part smooth, thin and pliable (Fig. 1). There was no evidence of fusion or separation of the commissures, and no shortening of the sinuses of Valsalva.

The *lungs* showed œdema, hyperæmia, thrombosis of pulmonary arteries and a small early infarct in the right lower lobe. The uterus was the seat of many subserous calcified fibroids and showed several endometrial polypi. The balance of the organs showed no significant changes except for chronic passive hyperæmia.

Microscopical findings.—Section taken to include the subaortic fibrous ridge and adjacent myocardium showed slight increase in transverse diameter of muscle fibres and hyperæmia of capillaries present in subendocardial position. No areas of degeneration or inflammation could be demonstrated in the myocardium. The endocardium however, was markedly thickened and elevated (Fig. 2). The subaortic band of fibrous connective tissue described in the gross, was the seat of extensive hyalinization, and was focally infiltrated by moderate numbers of lymphocytes and occasional histiocytes. No distinct Aschoff nodules were present and no fibrinoid necrosis of collagen could be definitely demonstrated (Fig. 3). However, in a number of situations, the fibrous tissue in the subaortic band revealed œdema.

Fig. 2.—Low power view to show, in addition to the subaortic fibrous band. the distinct bulging of the muscle of the interventricular septum into the left ventricular outflow tract. Hæmatoxylin and eosin.

Sections stained by the Verhoef method, showed a distinct limiting elastic lamella between the thickened subaortic fibrous band and the adjacent myocardium. At one point however, a marked fraying, reduplication, and fan-wise spreading of fine undulating elastic fibrils, extended into the fibrous band for variable distances. In this region the subendocardial elastic lamella was fragmented (Fig. 4).

Numerous additional sections of left auricle and left ventricle showed diffuse, slight interstitial fibrosis of the myocardium with slight increase in transverse diameter of myocardial fibres of the left ventricle. No evidence of necrosis, inflammatory infiltration, or specific Aschoff body formation was present. The endocardium lining the left auricle and portions of the left ventricle showed slight thickening and occasional sparse infiltration by lymphocytes and histocytes, but no areas of fibrinoid degeneration or specific inflammatory change were en-

countered anywhere. The mitral valve leaflets showed no significant thickening, vascularization or infiltration by round cells. Sections taken from the right auricle and ventricle failed to reveal the stigma of rheumatic heart disease.

The only other significant microscopic findings were early periportal cirrhosis of the liver and adenomyosis of the uterus.

Final anatomical diagnosis. — Subaortic stenosis, chronic non-specific endocarditis of endocardium of left side of heart, cardiac hypertrophy (predominantly of left ventricle), hydropericardium, hydrothorax right, chronic passive hyperæmia of viscera, thrombosis of pulmonary arteries, pulmonary œdema, early infarct of lung right lower lobe, early periportal cirrhosis of liver, adenomyosis of uterus, pleural adhesions bilateral, subserous calcified fibromyomata of uterus, endometrial polypi, external hæmorrhoids.

DISCUSSION

The pathogenesis of subaortic stenosis is controversial. Several theories have been advanced to explain the formation of the subaortic fibrous band. The most popular is probably the one offered by Keith,[6] in which he points out that in the phylogenetic development of the heart, the *bulbus cordis,* ordinarily a separate chamber at an early stage, eventually becomes overwhelmed by the musculature of the ventricles, and is incorporated as an intrinsic part of the ventricular system. A persistence of the demarcation between the embryonic bulbus cordis and the original ventricle, would remain in the adult heart as a ring separating the vestibule of the aorta from the rest of the left ventricle. Taussig[13] amplifies this concept by stating that the fibrous ridge normally occurring at the junction of the bulbus cordis and the ventricle fails to atrophy, and its persistence is responsible for the fibrous band seen in subaortic stenosis. The views of Keith[6] and Taussig[13] are convincing, since the position of a fibrous ring separating the aortic vestibule from the rest of the left ventricle would coincide most closely with the area of stenosis described in the great majority of cases. No direct proof however, has yet been advanced to substantiate this theory. Indeed, if this be the mechanism involved, it is curious that a greater number of these cases are not associated with malformations of the outflow tract of the right ventricle, since a greater portion of the original bulbus is actually allotted to the right side of the heart, rather than to the left. Keith[6] however, has described instances in which subpulmonic stenosis has been explained on this basis.

A second theory to be considered is one ascribing the formation of congenital cardiac defects to inflammatory processes occurring during intrauterine life. Albaugh[3] has shown that many mothers who contract rubella during the first two months of pregnancy, give birth to infants with congenital anomalies, including cardiac septal defects and patent ductus arteriosus. Farber and Hubbard[9] in a review of 14 cases of congenital heart disease found in every instance gross and microscopic evidence pointing to an old inflammatory process. This must have occurred during intrauterine life, in view of the early deaths of the infants. No cases of subaortic stenosis were included in their series. Cosgrove and Kaump[11] on the other hand, point out that the microscopic changes seen in congenitally deformed hearts cannot be regarded as inflammatory in most cases, but rather as

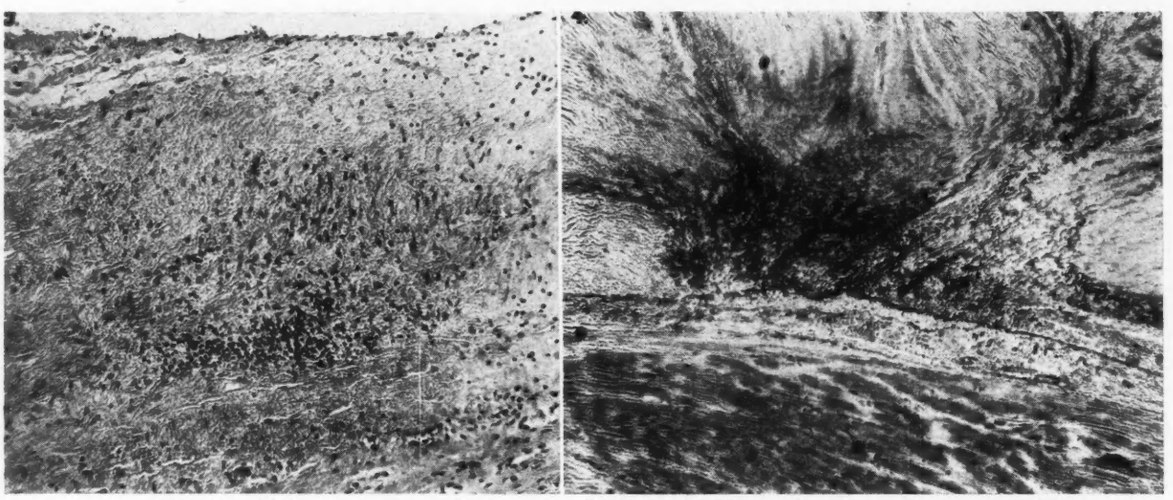

Fig. 3.—High power microphotograph of subaortic fibrous band to show non-specific lymphocytic and histocytic infiltration. There is œdema of the connective tissue. Hæmatoxylin and eosin. **Fig. 4.**—High power microphotograph showing fragmentation of subendocardial elastica with fraying and fanwise extension into subaortic fibrous band. Verhoef stain.

degenerative in character. Gross[10] believes that the microscopic lesions, if inflammatory, are too sharply localized to account for the gross malformations. He compares many of the myocardial changes seen, to bland infarcts, since no endarteritic vascular lesions are present.

A third viewpoint which might be considered is one which suggests the possibility of the subaortic fibrous band being the result of an inflammatory process occurring in post-natal life. Two of Gruenwald's[14] cases showed an associated mitral and aortic valvulitis, and a third case showed syphilitic scarring of the aorta and the aortic valve. It is interesting to note that in the case presented above, Dr. Simon's comment at the time of autopsy was:

> "The endocardium in this heart shows distinct thickening, with a non-specific histocytic and lymphocytic infiltration, most marked in the area of subaortic stenosis. There are no specific features in this heart which would enable one to make an unequivocal diagnosis of rheumatic heart disease. The subaortic lesion shows, in addition to the thickened subaortic ridge of connective tissue, a distinct bulging of the upper portion of the interventricular septum into the outflow tract of the left ventricle. It is interesting to speculate whether this subaortic stenosis shows features of both a congenital anomaly of the bulbus cordis and an additional acquired subaortic endocardial inflammation."

Wiglesworth[7] has emphasized that the disposition of the elastica in subaortic stenosis is of significance in the determination of the congenital nature of this lesion. In the case which he reported, the subaortic ring was composed principally of elastic fibres with a poorly demarcated central area of fibrous tissue. In addition, there was an elastic tissue layer at the periphery of the ring which was continuous with the endocardial elastica. The continuity of the peripheral ring of elastic tissue with that of the endocardial elastica was interpreted by Wiglesworth as evidence that the subaortic ridge was congenital in nature. In our case however, the ring contained far less elastic tissue. It was made up mainly of hyalinized fibrous connective tissue which was in most situations superimposed upon the endocardial elastica (Fig. 4). There was also a distinct non-specific chronic inflammatory reaction present, which was completely absent in the one presented by Wiglesworth.[7] These features suggest that the fibrous subaortic ridge in the present case may have been acquired or augmented subsequent to the original cardiac anomaly.

In the cases in which subaortic stenosis is the only developmental abnormality, several different patterns of clinical behaviour can be observed. Some of the patients die during infancy,[13] the degree of the malformation being too severe to be compatible with prolonged life. Others succumb during childhood or adolescence because of an associated bacterial endocarditis.[7, 14] The case presented above and five of the patients reported by Gruenwald[14] appear to fall into a third group, in which the subaortic lesion is relatively benign, the average age of death here being well over 50 years.

The clinical manifestations of this cardiac anomaly obviously depend upon the size and extent of the subaortic ridge which determines the degree of the subaortic stenosis. The clinical diagnosis, although difficult, has been successfully made in a number of instances.[5, 12, 14] Walsh, Connerty and White[5] state that this condition may be suspected in patients under 20 years of age when there is no history of rheumatic fever and the patient presents the auscultatory signs of a well developed aortic stenosis and a normal or nearly normal second aortic sound. They point out that acquired stenosis of the aortic valve seldom occurs in patients under 20 years of age. More recently Shapiro[8] (quoted by Gruenwald) has reported several patients under observation in whom the clinical diagnosis of subaortic stenosis has been made. In the future angiocardiography may prove to be the most reliable method for the diagnosis of this condition. In the case reported by Grishman, Steinberg and Sussman,[12] this method was successfully used to diagnose subaortic stenosis in a boy 14½ years of age who had remained asymptomatic throughout life and was doing well when last observed.

SUMMARY

The clinical and pathological features of a case of subaortic stenosis in a 51-year old female have been presented. The patient gave no history of rheumatic fever and had remained asymptomatic up until the age of 35 years. The cause of death (myocardial failure), was presumably related to the malformation which produced a functional stenosis in the subaortic region. The heart showed a chronic, focal, non-specific endocarditis in the subaortic fibrous band.

The pathogenesis of subaortic stenosis has been considered and the various theories briefly discussed. It would appear that the concepts of Keith[6] and Taussig[13] offer the best explanation for the development of this lesion on a congenital malformation basis. However, the degree of subaortic stenosis may be variable, and may be augmented by superadded inflammatory lesions of different types. It is suggested that the subaortic stenosis in this case, is due to a combination of a congenital defect (produced as a result of a primary maldevelopment), augmented by a superimposed nonspecific, focal inflammatory lesion.

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MULTIPLE PRECORDIAL LEADS*

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FOR a number of years now, it has been the custom to take 4 lead electrocardiograms. These leads included the 3 standard leads, plus a lead from a single apical electrode. The use of this single chest lead was based on the assumption that the tracing from this precordial position would most frequently show abnormalities not seen in the standard leads. However, in 1943 the Committee for Standardization of Precordial Leads of the American Heart Association[1] pointed out that a single lead from any precordial position was grossly inadequate. They emphasized that over the right side of the heart typical right-sided tracings are obtained which are entirely different from those taken over the left side of the heart, and that between these two areas, right and left, each having a typical pattern, exists a transition zone which is variable in width and exact position from patient to patient, and in the same patient. If a single apical electrode is used, because of a slight variation in the exact position of the electrode or of the transition zone, it may fall just into the right zone giving a right-sided tracing, or just into the left zone giving a left-sided tracing, or just into the mid-zone giving a transitional tracing. Thus there may be such a marked difference between tracings supposedly taken from the 4th position that comparison is impossible in the same patient or from patient to patient.

The Committee further stated that although a lead from the 4th position would show abnormalities more often than any other single precordial position, "when the standard leads are normal, precordial leads most likely to yield significantly abnormal tracings are those from points lying between the left sternal border and mid-clavicular line". These points are entirely missed by the usual single precordial lead.

However, despite this very definite statement condemning single apical leads, all too many of us have remained unfamiliar with multiple precordial leads and unaware of their clinical value. Thus a review of these leads with emphasis on their value as a diagnostic adjunct may be in order.

In precordial electrocardiography the exploring electrode is placed in certain positions on the bony thorax. These points were standardized in 1938[2] [Fig. 1 (a)]. Position 1 is in the 4th interspace at the right sternal border. Position 2 is in the 4th interspace at the left sternal margin. Position 4 is in the 5th interspace in the mid-clavicular line, and Position 3 is on a straight line midway between positions 2 and 4. Positions 5 and 6 are on the same horizontal plane as position 4 in the anterior and mid-axillary lines respectively. Thus we have positions which are designated as C 1, 2, 3, 4, 5, 6. Any other precordial position may be explored with advantage[3] in certain obscure cases, but usually the standard positions are sufficient.

Precordial leads taken from these chest positions are one kind of unipolar lead. The term unipolar lead for practical purposes indicates that large potential variations often obtained from a point near the ventricular wall are to be compared to small potential variations obtained at a point distant from the heart, or in other words to a relatively indifferent point. The tracing will, therefore, represent the elec-

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trical events at this single point of high potential and be little influenced by the events at the indifferent point.

The position of the indifferent electrode, with which the exploring chest electrode is to be paired, varies. It may be on the right arm, in which case the leads are labelled CR1, CR2, etc. It may be on the left arm, in which case they are designated by the letters CL1, CL2, CL3, etc. Commonly the indifferent electrode is placed on the left leg, when the letters CF are used. The indifferent electrode which we have used, however, has been the special indifferent electrode of Wilson[4, 5] which he feels remains most constantly at zero potential, and therefore is most truly indifferent. Here an electrode is placed on the usual 3 limbs and each is connected through 5,000 ohms resistance to a central terminal. The letter V designates these leads where a chest electrode is paired with Wilson's Central Terminal.

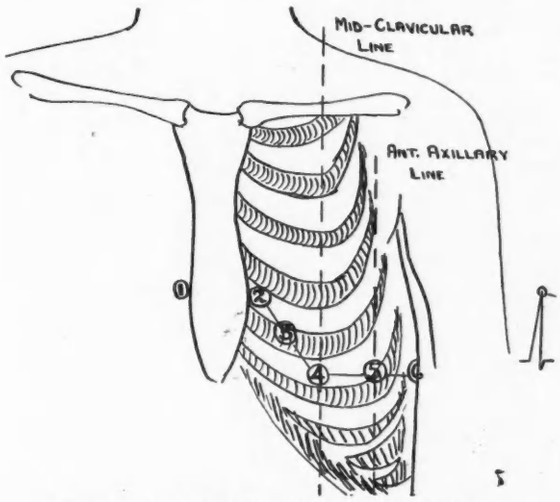

Fig. 1.—(a) Position of electrode on thorax.

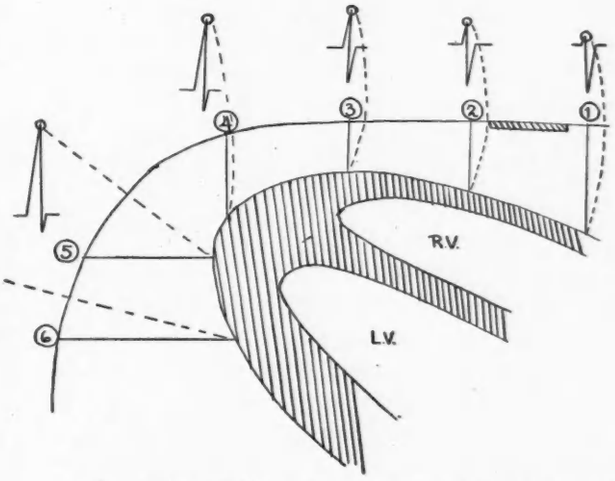

Fig. 1.—(b) Effect of position of electrode on configuration of QRS.

The deflections obtained with the unipolar chest leads are lettered in the conventional way that they are in the standard leads, namely, P, Q, R, S, T. The P wave with only a few exceptions, is not important in precordial electrocardiography. What we are mainly concerned with is the ventricular deflections QRS and T. There are a few facts which we should consider to help us understand the configuration of the QRS.

Experimental work by Lewis and Rothschild[6] and later by Wilson[7] showed that the peak of the R wave represented the beginning of electrical activity in the subepicardial muscle directly under the electrode. The other deflections of the QRS wave were attributed to activation of more distant muscle. Thus, prior to the peak of the R, deflections are due to muscle activated before the subepicardial muscle beneath the electrode and deflections following the peak of the R, are due to muscle activated after this localized subepicardial muscle.

Another important point to remember is that the cardiac impulse enters the septum from both sides travelling toward the middle and always travels from within, outward, through the walls of the ventricles. Normally, since the E.M.F. travels away from the ventricular cavities, these remain negative throughout the cardiac cycle. This ventricular negativity may be transmitted passively through the muscle to the exploring electrode when the muscle is not being depolarized by an impulse, or when it has been fully depolarized by an impulse.

A Q wave is present if the initial deflection of the ventricular complex is downward or negative. It is inscribed when the subendothelial muscle elsewhere in the ventricles is activated before the subendothelial muscle beneath the electrode. This earlier activity causes a negativity of the ventricular cavity which is transmitted passively to the electrode because the muscle beneath the electrode has not yet begun to depolarize.

The R wave is the first positive deflection of the ventricular complex. This wave indicates that the electrical stimulus is travelling through the muscle beneath the electrode out toward the subepicardial layer. If the ven-

tricular muscle is thick, the R wave is large, and the peak of the R occurs late in the QRS interval, indicating that it takes some time to fully occupy the ventricular wall to the subepicardial muscle. If the wall is thin, the R deflection is small and the peak early.

Following the peak of the R wave, the deflection moves sharply downward to the isoelectric line because after the activation of the subepicardial layer, the muscle beneath the electrode is fully depolarized so that there is no longer an E.M.F. moving toward the electrode to cause a positive deflection. The S wave is a negative deflection following the R wave. This wave is inscribed if some part of the ventricles is still being activated after the subjacent muscle is fully depolarized. This distant activity keeps the ventricular cavities negative, and this negativity is transmitted passively to the electrode through the fully depolarized muscle.

Now with these facts in mind, we can easily reason out the form of the complexes over the right and left ventricle [Fig. 1 (b)].

The right ventricle is thin-walled, so that not only is the R deflection small in amplitude, but also the peak of the R occurs early in the QRS interval because the subepicardial muscle is activated very rapidly. The S wave is large because other thicker parts of the ventricles are still being activated, keeping the ventricular cavities negative.

Over the left ventricle where the muscle is thick not only is the R deflection large in amplitude but also the peak of the R occurs late in the QRS interval because invasion takes a longer time to reach the subepicardial muscle. Over the left ventricle also, a small Q wave is common, because some part of the endocardial muscle other than that directly beneath the electrode may have been activated first. The left ventricular S wave is small because the subepicardial muscle under the electrode is nearly the last part of the heart to be activated.

Thus positions 1 and 2 give a typical right-sided tracing with a small R and large S, while 5 and 6 give a typical left-sided tracing with a large R and small S. Right-sided tracings give way gradually to left-sided tracings in serial leads through a transitional or intermediate zone which is variable as to exact position. Usually position 3 gives a transitional picture with the R and the S wave of about equal amplitude. In this case position 4 usually gives a left-sided tracing, but this is by no means the rule. The transitional tracing may be seen in the 4th position, or positions 3 and 4 may yield right-sided tracings which suddenly give way to left-sided ones in position 5 and 6 through no intermediate zone. Thus comparison of a tracing from a single apical position from person to person or in the same person may be impossible, for a great variability in the size of the R may be seen. Normally in a series of tracings the R is at first small, then in each succeeding strip it becomes larger, usually through a transition zone to a large R which gets a little smaller in position 6. The important point is that this series should not be broken. There is little danger of misinterpreting the size of the R if a series of precordial leads are taken.

The S-T segment represents the period of full depolarization of the heart. In precordial leads this is often very short or absent because early repolarization is recorded more accurately. Thus normally the S-T segment may go straight up into the T waves. Often in precordial position 1 and 2 it may be elevated 1 or 2 mm. Normally, it is not depressed, coved, or elevated more than 2 or 3 mm.

The T wave represents the period of restitution of the ventricles. In the first position it may be inverted and even in the second position. In both of these positions it may be flat. From V3-6 in a normal tracing the T waves are with few exceptions upright, getting more prominent to the 3rd or 4th position then diminishing slightly in size. This roughly parallels the increase, and then slight decrease in the size of the R waves. In a child the T waves may be inverted as far as the apex but are usually upright in position 5 and 6. Figs. 2 (a), (b), (c) illustrate these normal findings.

There follows now a discussion of the pattern of ventricular hypertrophy, ventricular strain, bundle branch block and infarction.

Before dealing with ventricular hypertrophy, it should be pointed out that the position of the heart may influence the electrical axis of the standard leads to a marked degree.[7, 8] Thus in a normal heart, we may have a right axis deviation in the standard leads due to the heart being in a vertical position and left axis deviation when the heart is in a horizontal

position. However, the form of the precordial electrocardiogram is not influenced by the position of the heart.[7] Therefore, in a normal heart, multiple precordial leads will yield normal tracings whether this positional axis deviation is present in the standard leads or not.

Even when there is true ventricular hypertrophy, the form of the standard leads are again influenced a great deal by the position of the heart, and may show no axis deviation, [Fig. 2 (e)], axis deviation of a varying degree, or even the "wrong" axis deviation. However, the precordial leads in this condition are frequently altered in a characteristic manner,[7, 9] and these changes are not influenced by the position of the heart. This typical precordial pattern is therefore a more reliable indication of hypertrophy than is axis deviation in the standard leads. I do not wish to imply that every case of ventricular hypertrophy shows the typical changes in the precordial leads, but so many do that precordial leads may be a very valuable adjunct in the investigation of this abnormality.

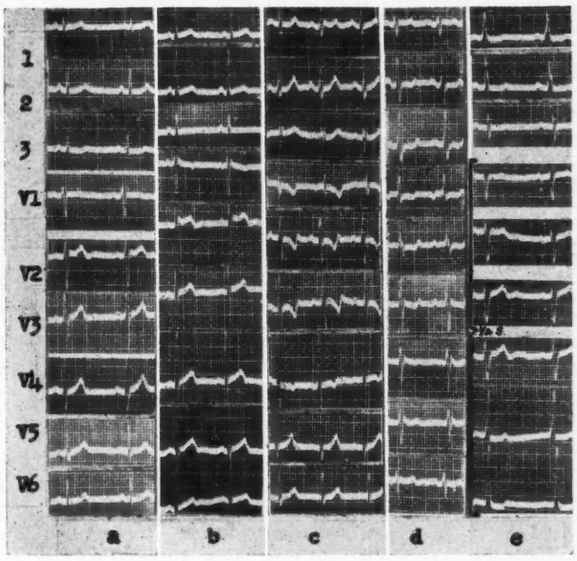

Fig. 2.—(a) (b) Normals. Note gradual increase and then slight decrease in size of R and T waves. Transition in position 3. (a) VT's upright. (b) VT 1 inverted VST 2 elevated. (c) Normal child. Note VT 1-4 may be inverted. (d) Right ventricular hypertrophy. Note prominent VR 1, 2 and VS 5, 6. Strain. Note depressed VST 1, 2, and small inverted VT 1. (e) left ventricular hypertrophy. V leads at ½ standard. Note prominent VS from right, and prominent VR from left. Note no distinct axis deviation in standard leads. Strain. Depression of VST 5, 6.

The picture of right ventricular hypertrophy in the precordial leads is characterized by an unusual prominence of the R wave in V1 and 2, over the right side of the heart because of the thickened right myocardium. The peak of the R occurs later in the QRS interval because the impulse takes longer to occupy the muscle to the subepicardial layer. The S wave is small because the thickened right ventricle is now nearly the last part of the heart to be occupied. Over the left side of the heart at V5 and 6 the S wave is unduly prominent because of this prolonged activity in the right ventricle. Right ventricular hypertrophy is then typified by a large R and small S in the right leads and a large S in the left ones [Fig. 2 (d)].

Left ventricular hypertrophy in the precordial leads is often evidenced by an exaggeration of the normal pattern, for normally there is a preponderance of the left ventricle. It is characterized by an increase in the amplitude of the S wave from the right, due to the increased activity in the left ventricle, and by an increase in the amplitude of the R from the left due to the thickened left myocardium. The peak of the R in positions 5 and 6 occurs later in the QRS interval indicating that it takes the impulse longer to reach the subepicardial layer. It is imposible to be dogmatic about where exactly left ventricular preponderance becomes indicative of hypertrophy but White[9] has found that an R wave from over the left precordium of over 25 mm. is probably significant. Besides these major changes, a Q wave may be seen in tracings from the left and the transition zone may be shifted to the left. Left ventricular hypertrophy is then typified by a prominent S in V1 and 2 and an R wave of over 25 mm. in V5 and 6 [Fig. 2 (e)].

Ventricular strain is a term which can be applied to precordial tracings when there is a change in the ST and/or T waves, opposite in direction to the major deflection over the affected ventricle. Thus, in right ventricular strain there is, in addition to the large R in leads from the right precordium, a depression of the ST and/or an inversion of the T waves [Fig. 2 (d)]. In left ventricular strain, a depression of the ST segment and/or an inversion of the T wave in leads from the left precordium is seen [Fig. 2 (e)].

The pattern of ventricular strain is usually associated with ventricular hypertrophy but may occasionally be seen in certain other conditions. The changes in the ST and T waves

are supposedly due to a relative ischæmia which first affects the subendocardial muscle.[8] As this ischæmia increases in duration and severity, there is eventually an interference with the conducting tissue lying in the subendothelial tissue giving rise to a prolongation of the QRS to 0.11 seconds. This interference may proceed to bundle branch block.

In bundle branch block[7] [Fig. 3 (a), (b), (c)] we have a pattern somewhat similar to that seen in strain, but there is a prolongation of the QRS to over 0.12 seconds and a splintering of the complex. The T waves are commonly in a direction opposite to that of the major deflection over the affected ventricle as in strain. Wolferth[10] states that precordial

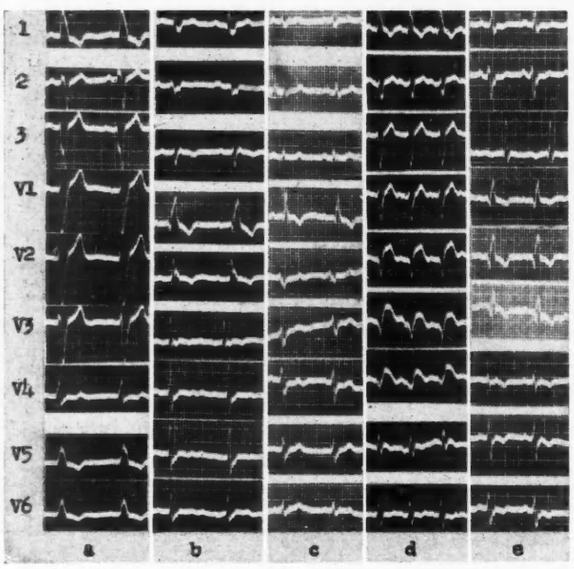

Fig. 3.—(a) LBBB. Note QRS prolonged to 0.12 sec. and splintered. Prominent R over the affected ventricle. VT 5 + 6 inverted. (b) RBBB. Note QRS prolonged to 0.12 sec. and splintered. Prominent R over affected ventricle. VQRS 1 in shape of lopsided M. VT 1 + 2 inverted. (c) RBBB diagnosis easily missed in standards. (d) LBBB plus antero-septal infarction. QRS = 0.12 sec. No small R wave from right. Note VQS 2-4, VQ 5 and elevated VST 2-4. (e) RBBB plus antero-septal infarction. QRS = 0.12 sec. No small initial upward deflection from right. Note VQ 1-3. Small VR 4. T waves inverted particularly VT 2 + 3.

leads are far superior to limb leads for the localization of an intraventricular conduction defect.

In right bundle branch block, in addition to the prolonged QRS there is in leads from the right precordium a prominent splintered R deflection often in the shape of a lopsided M with a short first limb. The initial R wave is due to current passing through the septum from left to right distal to the bundle branch block giving rise to an initial positivity of the ventricular cavity which is transmitted to the electrode. This positivity subsides because of the opposing outward activation of the left ventricle and a downward deflection follows. An R1 wave occurs with the later unopposed activity of the free wall of the right ventricle beneath the electrode. Leads from the left side give a prominent broad S wave due to the delayed activity in the right ventricle keeping the ventricular cavities negative [Fig. 3 (b)].

The pattern of left bundle branch block in the precordial leads is also definitely diagnostic. There is, in addition to the prolonged QRS, a broad splintered R wave over the left precordium, again often in the shape of the lopsided M. Here, the initial upward deflection is due to the impulse passing from right to left through the septum distal to lesion. The broad slurred R1 deflection is due to the delayed activation of the left ventricle. There is a prominent S seen in tracings over the right heart, again due to this delayed activity keeping the ventricular cavities negative. The transition zone is frequently shifted to the left. A Q wave is not seen in V5 and 6 in an uncomplicated left bundle branch block [Fig. 3 (a)].

The pattern of right bundle branch block may not be definitely apparent in the standard leads, and precordial leads are most valuable in definitely localizing this conduction defect [Fig. 3 (c)]. On the other hand, left bundle branch block can nearly always be diagnosed from standard lead 1. We have not seen one in which this was not the case.

Now we turn to myocardial infarction.[5, 7, 11] Infarcts may be fairly typical clinically and easy to diagnose, or else the picture may be confused and difficult. In any case, a cardiogram is often helpful in that a clinical impression or suspicion may be established firmly upon objective evidence. Sometimes, however, particularly when serial tracings are not taken, the four lead cardiogram does not confirm the diagnosis or solve the problem. In some of these cases, serial tracings will give a definite diagnosis. In others, there may never be changes diagnostic of infarction, even though an infarct may be present. Multiple precordial leads are particularly valuable in this whole field, often giving valuable information before

the other leads are changed, and often indicating the exact position and extent of the infarction when the conventional leads do not.

In the diagnosis of infarction from precordial leads, there are three essential parts to the pattern, an elevation and/or coving of the ST segment, a partial or complete disappearance or the R wave, and later inversion of the T wave.

If the coronary artery of a dog is clamped,[11] and direct leads taken from the myocardium, the first recorded change is an elevation of the ST segment. This is due to the so-called current of injury which usually subsides. Then there is a pronounced decrease or disappearance of the R wave over the infarcted area. In the centre of this infarcted area, if all the muscle is necrosed, the negativity of the ventricular cavity is passively transmitted to the overlying electrode. This produces a deep downward deflection called the QS. If, however, some muscle remains alive, producing an E.M.F. between the electrode and the ventricular cavity, as is often the case in less serious infarction, or in tracings from the margins of an infarcted area, a different contour is seen. Here, it is the subepicardial muscle that is usually spared. Thus we have an initial downward deflection, or a Q wave, because negativity of the ventricular cavity is at first transmitted to the electrode and then a small R deflection due to the activation of the subepicardial muscle later. The R may or may not reach the isoelectric line depending on how much viable muscle there is. This deflection is frequently followed by an S wave, for, once again, after the occupation of the subepicardial muscle, the ventricular negativity influences the electrode. Thus in a small infarction, or from the margins of an infarcted area, a W-shaped QRS may be obtained.

The sharp inversion of the T wave, which begins to appear as the ST segment subsides, if often more conspicuous in leads from the periphery than from the central portion of an infarct. This inversion is apparently due to a prolongation of electrical systole in the subepicardial muscle in the zone surrounding the infarct, but nothing is known for certain of the genesis of the T wave changes.[10]

Wilson[7, 11] puts great emphasis on the value, diagnostically, of an alteration of the QRS, but points out that the ST and T waves vary so rapidly that these changes may be diagnostic in serial tracings. Nevertheless, he maintains that infarctions which produce no lasting modification of the QRS in precordial or standard leads, are likely small or incomplete, and seldom serious. Wilson classifies infarction on the anterior and lateral surfaces of the heart into 4 groups depending on the area involved.

First, there is an extensive anterior infarction where the QRS and T wave changes are seen involving all the precordial leads, or all but one across the precordium [Fig. 4 (a)]. This type of infarction can frequently be diagnosed with the usual leads. However, we have one case [Fig. 4 (b)] where an extensive anterior infarction was indicated in the multiple precordial leads and confirmed at autopsy, but yet the standard leads were definitely not diagnostic. Even when the pattern of recent infarction is visible in the usual leads, its extent is not indicated without multiple chest leads.

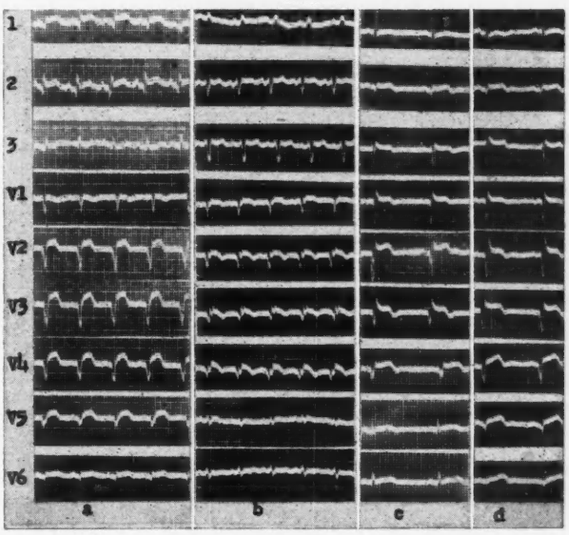

Fig. 4.—(a) Extensive anterior infarction. Note no VR waves, only deep QS across the precordium. VST 2-6 elevated. VT 1 inverted. Note change in standard leads. (b) Extensive anterior infarction—proved at autopsy. Standard leads not diagnostic. Note deep initial downward deflection in V 1-4. VR 5 + 6 very small. VST 1-4 elevated. (c) Antero-septal infarction. QS pattern from right. W shaped VQRS 4. Note VR 5 + 6 present. (d) Same patient 3 days later. VR 5 + 6 disappeared so that QRS changes now extend right across the precordium. Definite evidence of extension of the infarct. Standard leads show only minor changes.

Next there are antero-septal infarctions, so diagnosed because they show the most pronounced changes in the ventricular complexes in leads from the right precordium extending

to the apex, but show no changes in V5 and 6, or only T wave changes in V5 [Fig. 5 (a)]. Because antero-septal infarcts may not involve the lateral surface of the heart, there are often no diagnostic changes in standard lead 1 [Fig. 5 (b), (c)] and because the infarcted area may not reach to the apex there may be no diagnostic changes in lead 4 [Fig. 5 (d) (e)]. Thus, multiple precordial leads are very valuable in the definite diagnosis—particularly the early diagnosis—of this very common infarct.

If the changes in the ventricular complexes are confined to leads from the left side, namely V5 and 6, the infarction is antero-lateral [Fig. 6 (a)]. This type can usually be diagnosed from lead 1, but the usual 4th position may be inside the infarcted area and normal.

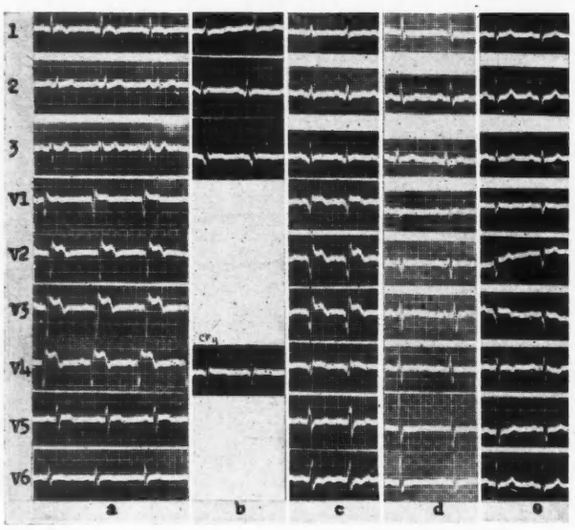

Fig. 5.—(a) Typical antero-septal infarction. VR 1-4 absent. VST 1-4 elevated. Note standard lead 1 diagnostic. (b) Usual 4 leads abnormal but not indicative of infarction. (c) Same patient as (b) 2 days later. Deep QS in V 1-3 and W shaped QRS in V 4. VST 1-4 elevated. Indicates an antero-septal infarction. Standard leads not diagnostic. (d) Another patient. Abnormal tracing but does not suggest infarction. (e) Same patient as (d) taken 3 weeks later. V leads show VR_2 smaller, VR_3 absent, VST 2 + 3 slightly elevated, VT 4 small inverted. Small antero-septal infarction with major diagnostic changes inside the apex.

Sometimes the diagnosis of an antero-septal or lateral infarction is made, but when the tracing is repeated, more leads may demonstrate the deep QS pattern [Fig. 4 (c), (d)]. Thus, multiple precordial leads may give definite evidence of extension of a small infarction to involve a greater area of the myocardial.[12] The usual 4 leads would not yield this valuable information.

There is one other group, the postero-lateral group, which is important. In a completely posterior infarction the only diagnostic leads are standard leads 2 and 3 which display the QT pattern [Fig. 6 (b)]. But often a posterior infarction may extend over the left ventricle to involve the lateral surface of the heart. Because of this, V5 and 6 may show typical changes in addition to those seen in standard leads 2 and 3. Standard lead 1 also indicates changes on the lateral wall. Thus lead 1 is frequently altered too. Therefore all 3 standard leads are altered, which might indicate anterior and posterior damage. By taking multiple precordial leads, it can be shown that the infarct does not involve the anterior surface of the heart [Fig. 6 (c)]. These infarcts are essentially posterior ones from an

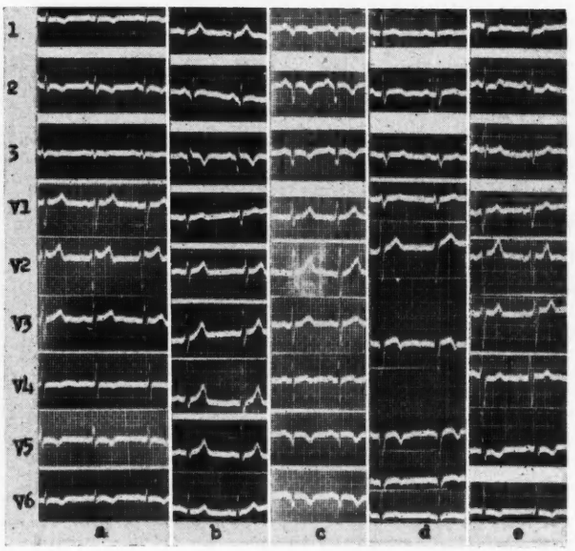

Fig. 6.—(a) Antero-lateral infarction. Serial changes were confined to the lateral wall of heart. VR 5 + 6 comparatively small. VT 5 + 6 sharply inverted. Note diagnostic changes in standard leads. (b) Posterior infarction diagnosed on standard leads 2 + 3. V leads little affected. (c) Postero-lateral infarction. Serial tracings progressed so that not only could posterior infarction be diagnosed by changes in standard leads 2 + 3, but also lateral wall involvement could be recognized by the W shaped VQRS 5, the VQS 6, and the T wave inversion in V 5 + 6 and in standard lead 1. (d) Small localized antero-septal infarction based on progressive localized ST and T changes in the V leads. (e) Localized damage based on T wave inversion in leads outside the ordinary apical position following exercise.

occlusion of a posterior artery which has infarcted the posterior and lateral surface of the left ventricle, and are not due to a double occlusion. Thus once again these leads are a valuable indication of the extent of the infarct.

In another similar respect the series of precordial leads may be valuable, that is, they may

indicate a localized area of damage on the anterior or lateral surface of the heart based on T wave abnormalities alone. If these T waves show typical serial changes, an infarction can of course be diagnosed [Fig. 6 (d)]. If they are stationary, however, old damage is probably present. With a single apical lead this localized area of damage can easily be missed [Fig. 6 (e)], or else if the tracing is altered one can only speculate as to whether there are more serious changes inside or outside that position.

Finally these chest leads are valuable in diagnosing an anterior infarction associated with bundle branch block. In the standard leads bundle branch block obscures the pattern of recent infarction. The precordial tracings, however, may show the initial deflection to be downward and often deep, and a coved ST segment [Fig. 3 (d), (e)]. These changes in the usual pattern of bundle branch block may be diagnostic of recent anterior infarction.

SUMMARY

1. There may be such a marked difference between tracings taken with a single apical electrode due to variation in position of the electrodes or of the transition zone, that comparison is impossible in the same patient or from patient to patient. But multiple precordial leads give a sequence which is useful for comparison because a change in the pattern is of significance.

2. Normal hearts showing axis deviation on the standard leads due to position of the heart will have a normal precordial series.

3. The pattern of ventricular hypertrophy and the pattern of ventricular strain in precordial leads are together or separately quite a reliable indication of actual myocardial hypertrophy though they do not always occur in this condition.

4. Bundle branch block can be more accurately localized in precordial leads, and these leads are particularly valuable in the diagnosis of associated anterior infarctions.

5. Precordial leads inside or outside the ordinary apical position may be the first to show signs diagnostic of infarction.

6. Leads from precordial positions 1, 2, 3, may be the only leads ever to show definite signs of infarction.

7. Precordial leads will indicate not only the extent of an infarction, but may in serial tracings indicate extension of a small infarct.

8. The series of precordial leads may indicate a localized anterior area of damage, based on T wave abnormalities alone.

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CASE REPORTS

LABOUR COMPLICATED BY CERVICAL ATRESIA

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That atresia of the cervix is rarely met with by the obstetrician is not surprising; for by definition one must assume that atresia and conception are incompatible. Dorland[1] defines atresia as "imperforation, absence, or closure of a normal opening". DeLee[2] states that acquired or stenotic rigidity of the cervix is "surprisingly rare", and mentions among the etiological factors chronic cervicitis, deep cauterizations, operations upon the cervix, radium treatment and advanced age. Other authors deny that complete occlusion during pregnancy can occur. Kurtz and Gallaher[3] recently presented a case of cervical atresia during labour, which was managed by Cæsarean section; and noted in reviewing the literature on the subject that 19 such cases had been reported up to 1928, of which 13 were well authenticated. Acosta-Sison reported a case in 1929, and Kurtz and Gallaher a case in June, 1947.

These together with the present case make a total of 22. Granting that there have been no

doubt many other cases not reported, as well as some since 1929 which were not reviewed, we are none the less left with little doubt as to the rarity of this condition.

Mrs. E.P., aged 27, grav. viii, para. v, presented herself for this pregnancy at the office June 3, 1948, at about 5½ months' gestation. Last menstrual period was December 10, 1947, making the estimated date of confinement September 17, 1948. A summary of the previous obstetrical history as given by the patient revealed the first pregnancy in 1937 to have been normal, with a 16 hour labour, followed by delivery of a 7½ lb. male infant at home. Patient was in bed 18 days. The second pregnancy ended in abortion at 3 months, no operative procedure being necessary. Third pregnancy in 1941 terminated normally with delivery of a 7 lb. female after one and one-half hours of labour. The fourth pregnancy in 1942 was similar in outcome. The fifth pregnancy again ended in abortion at 3 months in 1943. Personal records of the sixth and seventh pregnancies reveal that both were normal, the former terminating in spontaneous delivery of a 7 lb. 6 oz. female child July 3, 1945; and the latter terminating similarly March 10, 1947, in the birth of a female infant weighing 8 lb. 13 oz., after a 5½ hour labour. Neither instrumentation nor repair was required in either of these last two cases. My records show that the six week post-natal examination after each of these deliveries was negative except for a retroverted and flexed, normal-sized uterus, and in both cases a cervix pointing forward, with a mild circular erosion. The cervix following the last delivery was slightly patulous. At no time was there any record of previous injury, surgery, infection, or cauterization of this cervix.

Examination when first seen in the present pregnancy June 3, 1948, revealed a fairly well developed and nourished white adult of about stated age. General physical examination was essentially negative. Palpation of the abdomen revealed a fundus four fingers above the umbilicus, with a strong fetal heart audible in the midline. Pelvic examination at this time revealed a healthy, soft cervix, and a slightly lax vagina, with no unusual discharge. Gestation continued uneventfully until the visit of August 16, at approximately 8 months, when the patient stated she had "spotted" vaginally for about one week, from July 25, to August 1. This had apparently not alarmed her, for she had not called. Examination at this time revealed a fundus two fingers below the xyphoid, L.O.A., with floating head, and fetal heart regular in the L.L.Q. Patient was cautioned to rest a little more if possible, and to return in two weeks, or to call at any time that bleeding began. When seen September 3 there had been no more bleeding and the head was still high. On September 14 at 12.40 a.m. patient was admitted to hospital with 5 min. pains, membranes intact, and no show. She stated that she had vaginal bleeding five days previously, using three pads, and "spurting" a little. Pains had begun Saturday September 11, and continued all day at irregular intervals. She felt a few contractions on Sunday and Monday. These became regular and fairly close just prior to admission early Tuesday morning. There had been no more "show" since Thursday, September 9. Following admission the pains rapidly became close, every 2 to 3 minutes, with good contractions. No dilatation could be made out on rectal examination however, although the head was well engaged and patient was bearing down with each pain. Considering the previous short labours this was thought unusual, and a vaginal examination was performed under anæsthesia at 3.00 a.m., September 14. As patient strained down with her pain, what looked like a breech presented, and an undiagnosed breech was thought to be the answer. Closer inspection however, together with digital examination, revealed a perfectly smooth, pink, bulging pelvic floor, continuous on all sides with the vaginal vault. No os could be felt, and the fetal head could be felt above the thinned out lower uterine segment, which bulged the perineum during a contraction. Speculum examination revealed a tiny spot of granulation tissue about the size of a large pin-head, where the cervix should have been. There was no thickening in this area however.

The question now arose as to whether delivery should be effected by Cæsarean section, or whether the lower segment could with safety be incised. It was decided to attempt to open the cervix from below, and if hæmorrhage occurred to pack the vagina and section the patient. The latter course was not necessary. Strong digital pressure on this small granulating area caused the thinned out lower segment to suddenly "fall away", revealing a definite internal ring which quickly dilated to three centimetres and was manually stretched to about five. The membranes presented and were ruptured, with a gush of dark brown amniotic fluid, suggestive of a monstrosity. The head was now found to be in an L.O.T. position at the brim, and with a pain it descended to the spines. Twenty minutes later the caput presented at the vulva and was expelled precipitately, followed by the shoulders and body. The placenta separated and followed at once. A 7 lb. 9 oz. male child was delivered, whose condition at birth seemed good; but 5 hours later respirations became laboured and colour poor. The baby expired 12 hours after birth. No autopsy could be obtained, but a clinical diagnosis of atelectasis was made, together with possible intracranial injury. The patient's puerperium was uneventful, leaving hospital on the fourth day, and remaining in bed at home until the seventh day.

This patient was last seen in the office October 26, when she appeared for her post-partum examination. The cervix at this time was forward, the canal short and patulous, with no discharge or erosion. Considerable laceration was present. The uterus was retroverted and flexed in the pouch. No complaints could be elicited from the patient.

The foregoing case history suggests that perhaps the title of this article is incorrect, inasmuch as the condition described may more nearly conform to the so-called "conglutination of the external os", rather than a true atresia, although in this condition a tiny hole can usually be seen with the aid of a speculum, and in the present case this was not present. Certainly a characteristic of conglutination is that by pressure of the finger the resistance of the external os can usually be overcome, and dilatation thereafter proceeds rapidly. This feature was definitely present in the case cited.

The remarkable thing about this case in my opinion is the complete absence of any history suggesting cervical disease at any time. Any suggestions regarding possible etiology would be welcome.

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TYPHOID FEVER TREATED WITH PHTHALYLSULFACETIMIDE

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Typhoid fever is too well known a disease to call for special comment, although of course it is recognized that it is now extremely rare in most men's daily practice. The following case therefore is presented not for any special features of the disease itself but as an instance in which one of the newer sulphonamide derivatives was used, with benefit.

The patient, a man of 41, first consulted me on September 23, 1948, complaining of general malaise which had been present for about 2 weeks. His temperature was 102°, but I could find nothing in his physical condition to account for it. He was given 300,000 units of penicillin intramuscularly, and some also by mouth, and was put to bed. On September 25, a blood culture was taken and was reported as negative the following day. However, as his temperature still persisted, a second blood culture was taken on September 26. The next day I saw 3 rose spots on the abdomen and made the diagnosis of typhoid fever. The patient was then admitted to the Toronto General Hospital. The significant findings there were as follows:

White blood cell count was 7,500.

Agglutination for bacillus typhosus was positive in all dilutions up to and including 1:80, and for brucella abortus up to and including 1:40. Agglutination was negative for bacillus paratyphosus for A and B in all dilutions. Blood direct serum was tested for heterophil agglutinins with sheep's blood with negative results. The blood culture continued to show no growth, and cultures of the urine and stool were also negative for *B. typhosus* or organisms of the typhoid dysentery group. However, the agglutinations for *B. typhosus* continued, and up to October 8 were positive in all dilutions up to and including 1:20. The agglutinations for *B. abortus* became negative on October 1. The blood culture taken on September 25 and originally reported as negative, after 72 hours' incubation showed *salmonella typhi*. On October 2, typhoid organisms were found in the stool. The urine failed to show typhoid bacilli at any stage. The fever continued in the neighbourhood of 101.3 to 102.3° until October 2, when treatment with phthalylsulfacetimide was begun, 2 tablets, 0.5 gm. each, being given every 3 hours whilst the patient was awake. The temperature at once began to fall, and by October 8, was normal. He was discharged on that date. There was recurrence of fever on October 21, when it again reached 100.2, and alternated up to 101° until October 27, when phthalylsulfacetimide was again given, 3 tablets every 3 hours. The temperature returned to normal on October 31, and has remained so. The patient is well and back at work.

This is only one case, but it is of interest in that the response to treatment in a proved case of typhoid fever was so prompt.

ACUTE SOLITARY DIVERTICULITIS OF THE CÆCUM*

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The commonest surgical emergency is acute appendicitis. Of the many non-appendiceal lesions encountered in the right lower quadrant of the abdomen, inflammation of a solitary diverticulum of the cæcum is a rare, unusual and occasionally unrecognized condition. It has apparently not warranted description in standard textbooks of surgery.

Clinically this disease is characterized by symptoms and signs of varying intensity, which simulate in all particulars those of acute appendicitis.

Seventeen of the less than 60 cases in the literature have had hemicolectomies or other radical surgery performed, because the lesion was either unrecognized at operation, or confused with tuberculosis or carcinoma. The surgical treatment of solitary diverticulitis of the cæcum involves simple resection of the diverticulum and its base. A case recognized at operation and treated in this manner is presented.

H.R., a muscular, white salesman, aged 31 years, was in his normal state of good health, when he developed severe generalized abdominal pain at noon on the day of admission. He returned home and rested. A physician was consulted that evening, six hours later, by

* From the surgical service of Dr. Mark Kaufmann, The Jewish General Hospital, Montreal, Que.

which time the pain had localized to the right lower quadrant and right loin region. There was no nausea, vomiting, or disturbance of bowel function. On admission to the surgical service the patient presented a flushed, ill appearance. Temperature 102.4°, pulse 148, respirations 28, blood pressure 120/48. Positive physical findings included an area of tenderness, splinting, and rigidity over the right loin anteriorly. Rebound tenderness was present. White blood cells 22,000; hæmoglobin 72%; urinalysis showed 2 or 3 pus cells, and an occasional red cell on microscopic examination. A preoperative diagnosis of acute appendicitis was made.

Operation.—Under spinal anæsthesia the abdomen was opened by means of a McBurney incision. The cæcum and appendix were examined, the latter exhibiting no gross evidence of disease. The cæcum and ascending colon were then further examined. A hard nodule the size of a twenty-five cent piece, coated with a thick fibrino-purulent exudate, was noted on the posterolateral aspect of the ascending colon approximately one cm. distal to the ileo-cæcal junction (Fig. 1). Dissection

Fig. 1.—Location of solitary diverticulum.

in this region revealed existence of a recent perforation with localized abscess formation. The cæcum was opened and a solitary diverticulum was identified. A probe passed into this found it to terminate in the inflammatory mass previously described. The diverticulum was resected, fragmenting in the process. The base and adjacent bowel were closed in two inverting layers. The appendix was also removed in the usual manner. The incision was closed about a cigarette drain placed in the right colic gutter.

The Pathology department reported: (1) Acute inflammation of fragments of colonic wall and fibroadipose tissue. (2) Slight chronic periappendicitis.

In 1937 Bennet-Jones reviewed 22 collected cases of this condition, including 3 of his own. Baker and Carlile classified 37 cases, 15 of which had undergone resection of the cæcum or ascending colon. Fairbank and Rob, in a recent report, of 2 of their own cases, found less than 60 cases recorded in the literature.

SUMMARY

A case of solitary diverticulitis of the cæcum with perforation and localized abscess formation is presented. The importance of its recognition and consideration in differential diagnosis is stressed. Simple local resection is the treatment of choice.

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SPECIAL ARTICLE

THE ARMY BENEVOLENT FUND

H. C. Chadderton

National Secretary, Army Benevolent Fund, Ottawa, Ont.

The Army Benevolent Fund, which represents some nine million dollars of canteen profits built up by soldiers of the Canadian Army during the Second World War, has completed plans for its organization and is in the process of setting up its administrative machinery across the Dominion.

Assistance from the Fund has been available for nearly two years through the Department of Veterans' Affairs but the Board which was established by Act of Parliament to govern the operation of the Fund is preparing now to assume complete responsibility, independent of the government. This Fund will be of particular importance to the medical profession, in that one of the main categories under which applicants can request financial aid is "medical treatment and care". Consequently, it is thought advisable that a review of the intent and purpose should be published for the information of practising physicians and surgeons.

Listed hereunder are the questions most often asked in our dealings with the medical profession, together with the answers. It is thought that this method will best serve the purpose of this article.

1. *How much money is there?* About $9,000,000 which is invested at 2½% and must, under the Act, last 50 years. It works out at roughly $285,000 a year but we plan to spend more in the years when the need is greater.

2. *Is this a government Fund?* No. The sole responsibility for its policy and administration is in the hands of a Board of five voluntary citizens.

3. *Who is eligible for help?* Any person who served in the Canadian Army in World War II, or is a dependent of such person.

4. *Is an eligible person entitled automatically to assistance?* No! Assistance is awarded on

basis of merit, and only if the applicant can meet the requirements under the intent and purpose of the Fund.

5. *What is the "intent and purpose"?* To assist deserving veterans' families, provided that such assistance is not the responsibility of government sources or private agencies, and provided that there is some assurance of a permanent solution to the difficulties which have brought about the distress.

6. *Why does the Fund have to ask creditors to accept reductions in veterans' accounts?* Simply because the Fund does not have nearly enough money to look after the responsibilities placed upon it. The average Army veteran is in the low income group and is just managing to get by on his wages without any surplus to handle emergencies. Hence there is a great call upon this Fund.

7. *By what method does the Fund attempt to settle an applicant's indebtedness?* We look at the total of his debts; then we establish a figure which we can justifiably spend on his behalf and apportion this second amount among his creditors, asking if they are willing to accept their share on a pro-rata basis in full settlement.

8. *Why do you consider the applicant as bankrupt?* Because he has debts and/or expenses which are far beyond his means and without help he can never pay them. In many cases he will lose his position if he cannot pay his debts, or at the very least his welfare and possibly his health will be affected, and consequently the creditors will stand to get no payment at all if we do not solve his problem.

9. *When the Fund asks the doctor to take a reduction in his account, isn't this intervention by a government-sponsored body between the doctor and his patient?* Definitely NO! In the first place the policy is made by the Board which is composed of business and professional men; the Government has no "say". Secondly, we feel that the Fund is not intervening between the doctor and his patient any more than any other financial agency (*i.e.*, debt collectors, financial adjusters, etc.) would be in carrying out their normal work.

10. *Isn't this practice of the Fund requesting reductions in effect placing a reduced value on the service rendered by the doctor?* Again, definitely NO! The Fund does not assess medical accounts. The Fund places *no* evaluation on service rendered. In fact, the Fund cannot even take into consideration the service which has been given—but merely looks at two things: (1) what does the applicant owe; and (2) how much can the Fund award to pay off the indebtedness.

11. *What happens if the doctor refuses the Fund's offer?* The Board policy lays down that where a creditor cannot accept what is considered to be a reasonable settlement, it will *not* be possible to make an award.

12. *Isn't this denying assistance to the veteran?* Yes, but the Fund has so many deserving applicants that it cannot possibly hope to help them all and if a case cannot be worked out on the basis of a reasonable settlement, the Fund feels justified in using the money on some other deserving case. In summary, the situation is that the extent of the task facing the Fund is *so* large that unless this policy is pursued it can be seen, looking to the future, that many necessitous and deserving cases will have to go without assistance from the Fund.

13. *How can the doctor be sure that the applicant is deserving of help?* Firstly, because if he were *not* deserving, this Fund would not be interested in his problems. Secondly, because the Fund is in a position to provide the doctor with the whole story of the applicant's financial distress after complete investigation of the facts.

14. *Is there any justification for the doctor giving special consideration to Army Benevolent Fund applicants over and above that given to other patients (i.e., non-veterans)?* That would depend on the circumstances, but so many of the veterans are just getting back on their feet after war service and often a costly family emergency at this time is sufficient to disrupt an otherwise successful rehabilitation plan.

15. *Does the Fund appeal to doctors on the grounds of sentiment?* NO. The Fund's appeal on behalf of the veteran is a business proposition, for two reasons: first, the applicant is bankrupt and if the creditor refuses our offer it is likely that his account will not be paid off in the foreseeable future; and second, we are trying to rehabilitate the man to make a self-supporting citizen out of him. In other words, if we succeed he will become a taxpayer and a good customer.

16. *Can the Fund guarantee that the applicant will not get into financial difficulties again?* No, of course not. However, we do insist that when assistance is awarded from the Fund there must be some evidence of a permanent solution and to this end we work with D.V.A. and other welfare agencies to ensure that proper service is rendered regarding family finances, and that all the applicant's problems are cleaned up at once.

17. *Where would a veteran or dependent apply?* At any D.V.A. office, Family Welfare Bureau or veterans' organization which does welfare work. If he is in the permanent force, through his padre or welfare officer.

18. *Does the Fund have administrative offices of its own?* Yes, one in each province, with a paid secretary through whom most dealings with creditors are handled. This secretary is available to provide information regarding the Fund and to co-operate in any way with doctors.

In conclusion, it should be mentioned that in the Fund's brief period of operation thus far, the relations with the medical profession have been very satisfactory and doctors have shown a keen interest in the work of the Fund. It is realized that it will not be possible for doctors to work with the Fund on every case we handle. Nevertheless, it has usually been possible for doctors to accept our plan of settlement and it is hoped that these arrangements can continue, and that members of the medical profession will realize the necessity for the Fund policy of rendering assistance on the basis of "bankruptcy".

Looking to the future, I can say that the Board wishes to avoid what is possibly the chief bone of contention between doctors and this Fund. I am referring to the difficulties which arise when the veteran (or his dependent) has requested medical attention without mentioning the fact that he or she cannot pay. What happens of course is that some weeks later the Fund gets the case and then has to ask the doctor to accept a reduction. Possibly the solution in such cases is to encourage the veteran to come to the Fund first so that we can consider the facts and go to the doctor with a firm commitment prior to treatment, and the Fund is attempting to educate the veteran body along these lines.

Examination of New Habit-forming Drugs

Many new synthetic anæsthetics and analgesic drugs, for use as substitutes for morphine, have been evolved in the past few years. The question now arises whether these drugs will prove to be habit-forming, and thus belong to the group of substances governed by the Conventions of 1925 and 1931, or whether, on the other hand, as substances "which are compounded, and which in practice preclude the recovery of the said drugs", they may be exempted from such control. The W.H.O. Expert Committee on Habit-forming Drugs, at its first session in Geneva, January 24 to 29, was required to make recommendations on this question and to consider requests, received from governments during recent years, for the exemption from control of several types of drugs.

After considering the reports submitted by experts on each of the drugs under examination, the committee recommended that the following substances and groups of substances be brought under the existing international conventions on account of their habit-forming potentialities:

Valbine. This drug is subject to control on account of its content of dihydrooxycodeinone hydrochloride, of the possibility of recovering this alkaloid from the preparation, and of the presence of a barbiturate, which constitutes an additional habit-forming danger.

Metopon hydrochloride (methyldihydromorphinone hydrochloride). Chemically metopon hydrochloride is a morphine derivative; it is a more powerful analgesic than morphine and has approximately the same properties as regards tolerance and habit-forming.

Acetylcodone (acetyldihydrocodeine hydrochloride). Although no specific information was available on its habit-forming properties, the committee considered that this substance should be placed under control because it is convertible to dihydrocodeine, which in turn is convertible to dihydromorphine, a habit-forming drug. These considerations apply equally to other esters of dihydrocodeine and their salts, and to dihydrocodeine and its salts.

Dolantin (Demerol, Pethidine, Piridosal) (1-methyl-4-phenyl-piperidine-4-carboxylic acid ethyl ester). Because of the powerful habit-forming properties of this substance and its salts, the committee recommended that they should be governed by the provisions of the 1931 Conventions.

Methadone (Amidone). The same provisions should apply to this drug and substances of similar chemical structure, on account of their habit-forming properties.

Precautionary measures with regard to synthetic substances. The committee was of the opinion that governments should watch with extreme care synthetic drugs of similar structure to those already examined, which may prove to have habit-forming properties. With reference to the experience already gained with substances of the Dolantin and Methadone groups, the committee recommended that any new convention should provide that substances of a particular chemical type, analogues of which have proved to be habit-forming, be placed under control until such time as they are shown not to be habit-forming.

Heroin (diacetylmorphine). The committee expressed its alarm that although the dangerous nature of heroin is now universally recognized, consumption of this drug has increased considerably in certain countries. Heroin is known to be more toxic than morphine, as its analgesic effect is from four to eight times more powerful. Its effect on the nervous system is much greater and 0.007 g. of heroin is sufficient to induce respiratory paralysis. Over the last fifty years, heroin has caused great havoc in the world. It is strange to note that in some countries heroin continues to be widely prescribed, while others have completely ceased to use it. The committee was of the opinion that further information was urgently needed on the reasons for the continued use of considerable quantities of heroin in some countries. Such data might be obtained through the World Medical Association. In addition, direct inquiries might be undertaken on the spot by sending experts to ascertain, from local physicians and sickness insurance services, the reasons why this drug is prescribed in preference to others.

Morphan. The committee was informed that German and American chemists have produced, by direct synthesis, a compound known as Morphan, in which the structure of the naturally occurring morphine alkaloid has been very nearly attained. This difficult synthesis is not at the moment a commercial possibility, but the synthesis of other compounds related to morphine is going forward and the progress of this research should be watched very carefully.

Finally, the committee was impressed by the variety of names given to the same drug by different manufacturers. Indeed, to avoid ambiguity, it had been necessary to give the full chemical formula of these substances. The committee drew attention to the advantages which would result if each substance could be given a recognized name by some authoritative and preferably international, body.—*Chronicle of W.H.O.*, **3:** 27, 1949.

THE CANADIAN MEDICAL ASSOCIATION

Editorial Offices—3640 University Street, Montreal

(Information regarding contributions and advertising will be found on the second page following the reading material.)

EDITORIAL

THE CENTENARY OF WILLIAM OSLER

WE are observing in this month and year the centenary of the birth of William Osler. And yet, such was his peculiar title to fame that it is difficult to associate his memory with so long a passage of time. Like many great men he had a quality of agelessness. It was this that gave him such a unique influence amongst younger men. Freshness of mind, intensity of purpose (even though it was so widely applied) and a diligence unsurpassed, charity truly exercised, character—all were part of his greatness. But whether it was these elements so mixed up in him, or whether it was a quality *sui generis*, he had an extraordinary capacity to stimulate others, of all ages; he was indeed a potent ferment, in R. P. Howard's famous phrase, but a ferment which generated affection as much as action.

The details of his life need not now be recalled; for few great men have biographical data been more freely available, or better turned to advantage. Inevitably we speculate how he would meet the modern complexity of medicine. But the secret of his power lay in his capacity to see life steadily and see it whole. This did not necessarily mean simplification of problems, even though he may have seemed to attempt that. He refused to be distracted by multitudinous interests. He seemed to develop a technique of withdrawing himself and yet of always being approachable. No one spent himself more freely, but he allowed no waste of his time. A great personality is not dependent on his circumstances: Osler would be great in any century. Sir James Mackenzie told his friend Dr. McNair Wilson that "Osler came to see me when no other of the great physicians would have dreamed of coming". Other men added more factual knowledge to medicine than did Osler and for that may even be remembered longer. But it is impossible to measure personal influence against acquisition of knowledge. The man is often bigger than the thing.

MEN and BOOKS

THE CENTENARY OF THE BIRTH OF WILLIAM OSLER

In no department of our *Journal* is it more appropriate to commemorate the centenary of the birth of William Osler than in this one of *Men and Books*. It was Osler who gave it that title, and it was he who supplied it with its original choice material.

Our *Journal* was formally established in 1910, but its lineage extends back into the *Montreal Medical Journal*, which was preceded by the *Canada Medical and Surgical Journal*, thus completing an unbroken heritage of medical journalism reaching back to 1864. As early as 1888 Osler was helping his friend George Ross then editor of the *M.M.J.* by sending him *Notes and Comments* from Philadelphia. In 1896-97 he sent yet more, this time short clinical notes under the title of *Ephemerides*; and finally, in 1912, probably at the instance of his nephew W. W. Francis, then assistant editor, he took the title of *Men and Books* from one of Stevenson's collection of essays, and began his series.

He contributed altogether 26 of these papers in the course of 18 months. The variety is wide, and has all his peculiar spontaneity of choice. Many of them deal with what he was reading at the moment, or had bought for his library. But one of his best is his account of Lord Lister's funeral service at Westminster Abbey. It contains one of his few recorded impressions of music,* and even then is more concerned with the dramatic aspects of the scene.

> "Just before 2.30 p.m., after the organist had finished playing Chopin's Funeral March, there was heard at intervals a distant voice, high above the silence. At first the impression was of someone singing outside. I was waiting for it, having had, a few years ago, at the funeral of Lord Kelvin, the same experience. The choir coming through the cloisters sang the hymn 'Brief Life is Here our Portion', and the high note at the end of the third line alone reached us in the clear liquid voice of one boy. For three or four verses this was heard without another note of the full choir (the sound of which was not audible until the last verse) which finished just as the procession entered the Abbey. . . .
>
> "It was a noble and ever-to-be-remembered occasion. And was ever Handel's grand anthem sung more fittingly? 'When the ear heard him then it blessed him; and when the eye saw him it gave witness of him. He delivered the poor that cried; the fatherless and him that had none to help him. Kindness, meekness and comfort were in his tongue. If there was any virtue, and if there was any praise, he thought on those things. His body is buried in peace, but his name liveth evermore.' "

Two of his papers were after dinner speeches: one at the celebration of the bicentenary of Trinity College, Dublin, when he ran over the story of the Dublin School of Physic; the other as guest of honour at the Jewish Historical

* He also describes the singing of the Lincoln Cathedral choir in a fine passage in one of his essays in the collection *Æquanimitas and other Addresses*, H. K. Lewis & Co., London, p. 365, 1910.

Society of England, when he was at his discursive and allusive best.

He contributed no more after September, 1914, but he had well and truly laid the foundations of one of the numberless things which owe so much to his genius for encouragement.

H.E.M.

OSLER AND THE REPORTERS

with an unpublished note on "The Fixed Period"

W. W. Francis, M.D.

Osler Librarian,
Montreal, Que.

"Shun the Delilah of the press, or sooner or later you will be shorn of your strength, the confidence of your fellow-practitioners." "Never believe anything you read in the papers; if you happen to see something in them that you know to be true, begin to doubt it at once." Thus to his students. To the intrusive reporter, with his "Dr. Osler, I believe?" "No, sorry; often mistaken for him; my name is Davis—E. Y. Davis of Caughnawaga." Few reporters got through his door. If the faithful, soft-voiced Morris, his coloured man (Baltimorean for butler), was heard talking loudly, one knew he was lying for his master's good—the only consideration which would ever make him deflect a hair's breadth from the truth. "No, sir, Dr. Osler left for Timbuctoo this afternoon and won't be home till day after tomorrow"—an audible hint to his *protégé* not to appear in the hall till the front door closed again. If the pest did get by, he was apt to have his leg pulled, as when the great but diminutive Jacobi was staying in the house and the papers had half a column about his athletic prowess and how he held the record for the high jump with the New York Athletic Association. To another of the tribe, who had caught him on his doorstep, "Oh, no, I'm not the famous Dr. Osler; that's my father. You must often have seen the old man walking on Charles St. with the Cardinal about five every afternoon". "Of course." Unfortunately the exploits of Osler senior didn't get into print; the editor knew better.

Though quite unconscious of these slights, the press of America, and not only the "yellow" devils, took a cruel revenge. In 1905 Osler could well write, "The way of the jester is hard". To this day many even of those who wander into the Osler Library are more familiar with the infamous verb "Oslerize" than with the real significance of the proper name. The storm broke in February, 1905, a couple of months before he left for Oxford. It was before the days of "fan-mail", but the rest of the household had to work hard to protect him from the daily avalanche of *hate-mail*: bottles of chloroform labelled "use it on yourself"; a warning from a sexagenarian acquaintance in the City of Brotherly Love that he was waiting for him at the Pennsylvania station with a horsewhip; etc., *ad nauseam*.

What caused the rumpus? A bit of perfectly innocent comic relief in his valedictory address to Johns Hopkins University, a reference to "The fixed period", ending thus: "The teacher's life should have three periods, study until twenty-five, investigation until forty, profession until sixty, at which age I would have him retired on a double allowance. Whether Anthony Trollope's suggestion of a college and chloroform should be carried out or not I have become a little dubious, as my own time is getting short." He was then fifty-five.

Lady Osler, Revere and Sir William Osler

[This hitherto unpublished snapshot of the Osler family was taken in 1905, at Oxford, by Dr. C. K. Russel, who has been kind enough to loan it for reproduction.]

The address was printed in the second edition, 1906, of "Æquanimitas" with the following apologia in the preface:

> "'To interpose a little ease' to relieve a situation of singular sadness in parting from my dear colleagues of the Johns Hopkins University, I jokingly suggested for the relief of a senile professoriate an extension of Anthony Trollope's plan mentioned in his novel 'The fixed period'. To one who had all his life been devoted to old men, it was not a little distressing to be placarded in a world-wide way as their sworn enemy, and to every man over sixty whose spirit I may have thus unwittingly bruised, I tender my heartful regrets. Let me add, however, that the discussion which followed my remarks has not changed, but has rather strengthened my belief that the real work of life is done before the fortieth year and that after the sixtieth year it would be best for the world and best for themselves if men rested from their labours."

In 1919, during the long three months of his last illness, he kept by his bedside some officially surreptitious papers on which, when wife and nurse were not looking, he jotted down instructions largely about his library and its catalogue. A list of a dozen books designated

for particular libraries on account of their rarity or associations is printed in the catalogue, "Bibliotheca Osleriana", Oxford, 1929, on pp. xxx-i: a unique Rhazes of 1476 to the British Museum, three manuscripts to the Bodleian, Jenner's records of the "Gloster", alias Medico-Convivial, Society, to the Royal College of Physicians, Paré's Anatomy of 1561 to the Paris Faculty, and, among the rest, this tribute to the Army Medical Library at Washington: "So difficult to give anything to a collection so rich; but I thought that perhaps the manuscript of my farewell address, 'The fixed period', which caused a little excitement, would find its best resting-place in a library to which I owe so much and some of whose members—Billings, Fletcher, and Garrison—have been my intimate friends. It is the typewritten copy, as I read it, and I have put a note the printing of which might be deferred a few years." Unfortunately the manuscript had to go to Washington without the note; it had not been inscribed and it could not be found.

Since then what I take to be the intended inscription, or the basis for it, has turned up among some unsuspected comments written in Osler's hand. This note appears to have been written about 1906, in the same year as the preface quoted above. The Director of the Army Medical Library, Colonel McNinch, has kindly waived his presumable right to prior publication; and it appears here in print for the first time:

OSLER'S NOTE

"It is an interesting experience to wake in the morning and find oneself 'infamous'—the country ringing with criticism and the mails bringing reams of abuse. This is what happened to me on the 23rd of February. On the 22nd I gave the University address and made it a sort of valedictory. I had always had the idea —and talked about it very much—that after forty no very great work was done. From Montaigne I think I got it. Then Anthony Trollope's novel, 'The fixed period', and a contemplation of the burdens, mistakes and calamities of old age had made me pick upon sixty as the age when a man should get out of harness. In my address I dwelt upon these two points, and in a humorous way spoke of the advantage it would be to universities if at the sixtieth year professors were made to retire into a college—as in 'The fixed period'—for a year, at the end of which they would be quietly chloroformed, this being Trollope's suggestion. There was a great laugh, and I expressed my own doubt of the advisability of the scheme as I was myself approaching sixty. The exact words may now be read in the printed address, 'The fixed period'. That evening at the dinner we joked about it, but no one seemed to have thought anything very extraordinary had been said. The next morning, however, when the papers came out, the *New York Journal*, the *Herald* and the *World*, and the local papers! Big headlines, 'Useless at forty', 'Professor Osler recommends all at sixty to be chloroformed', 'Lethal chamber for the aged'. The fat was in the fire. Such a row! The truth is I had had a big advertisement in the comments made upon my Oxford appointment, and it was a slack season for news. Newspapers, letters, clippings, poured in and within forty-eight hours things began to look serious. No paper contained a correct statement of what I did say, so I sent it in two or three paragraphs to the *New York Sun*. Then I cut the matter off—so far as it was possible. I read nothing more about it and refused all interviews. But it was a deuce of a row and I was more sorry for my friends than I can tell. Mrs. Osler was very worried but I had made up my mind to take Plato's advice and creep under the wall of silence until the storm blew over. The newspapers worked it as good material regardless altogether of the occasion or the actual words. I do not believe any one took the trouble to give exactly what I said. One or two tried to be decent, the *New York Sun* and the *New York Post*, and E. S. Martin wrote some capital paragraphs in *Harper's Weekly*. To 'Oslerize', 'Oslerized' became common expressions. The hubbub did a good deal of harm, and I was heartily sorry for the many old people who were hurt by the outcry. Good came to a few—in stirring up the slackers and bringing the young men to work. I was pestered to death with reporters and for many months I could not sign my name in a hotel register. I kept a stiff upper lip so as not to let the thing get on my nerves, but it was an anxious and distressing time."

Osler was not the first, nor the last, to taste "the martyrdom of fame".

NEUROLOGY IN CANADA AND THE OSLER CENTENNIAL*

Wilder Penfield, C.M.G., M.D., F.R.S.

Montreal, Que.

This year has a special significance to Canadian medical men for it is the centenary of the birth of Sir William Osler. Medical specialists would do well to know him better, for in his transition from basic scientist to clinician they will find the pattern they are seeking—the pattern for the training of good specialists and good internists.

* Presidential Address at the inaugural meeting of the Canadian Neurological Society, Montreal, Que., May 21, 1949.

NEUROLOGY

A neurologist is a doctor of medicine who directs special attention to the study of the nervous system of man and to the correction of its derangements. This definition, you see, applies to the surgeon as well as the physician. In practice the two must divide the field for purposes of treatment. In a clinical sense I shall refer to neurology and neurosurgery as separate; fundamentally the word neurology covers the whole field.

Time was when physicians knew all there was to know about medicine—which wasn't very much! Then the barber put on a short coat, took up his scalpel and intruded himself into the profession. The result was that medical practitioners came to be divided into two groups, physicians and surgeons. But the line of cleavage was horizontal and not perpendicular. The physicians continued to be definitely, one might say consciously, superior. They thought much and they did little. The surgeons did much but they thought little. It seemed preposterous to the physicians to suppose that a man who would use his hands to lance a boil or cut for stone could also be educated in the mysteries of medicine.

After all, it would be rather pleasant if we surgeons could resign ourselves to the prescribed state of surgical amentia. It would be a great relief to refer responsibility for bad results to a higher authority.

MEDICAL EVOLUTION

Today, the face of medicine is changing. The impetus for this change finds its origin less in the clinical field than it does in the laboratories of basic science: biology, chemistry, bacteriology, physiology, anatomy, histology and even psychology.

The inevitable result of all this upsurge of knowledge, this test-tube revolution, is the appearance of specialization in the field of clinical medicine. Even if the many-sided genius of Leonardo da Vinci were added to the towering intellects of the physicians of our day, they would find it impossible to cover this enlarged field. Thus, new forms of specialization are forced upon us, and I like to think that the new lines of subdivision are perpendicular rather than horizontal. Specialization follows the major systems of the body—respiratory, gastro-intestinal, genito-urinary, reproductive, osseous, and, most important of all, the nervous system.

The time may come when the separation between surgeon and physician within some of these specialties will disappear, as it has done already in ophthalmology and otology. But the problems of the nervous system are so vast, and the neurosurgical operations so complicated, that I dare say this will never come about in the enlarging field of neurology. On the contrary, the future will produce still further intra-neurological specialization.

Patients often need a physician who understands all the recent knowledge that applies to one, at least, of the systems of the body; a physician who may or may not also be able to operate when required, but who adds to his specialized experience familiarity with the basic science of his field, the expanding science that has, after all, created that specialty.

The brain, the spinal cord, and the nerves together form one system. And yet, not one, but three major clinical specialties revolve about it: neurology, psychiatry and neurosurgery. Their differences can be expressed by describing the relationship of each to the nervous system.

Neurology scans it, examines its juices and broods over it. One might almost think that clinical neurologists expect to hatch something out of it. Psychiatry swings out into space through an enormous orbit, far away from the light of its own sun, the brain. Neurosurgery, on the other hand, not content to brood and not interested in nebular hypotheses, peels off the coverings of the nervous system and regards it with astonishment. The neurosurgeon removes things from it. He does much but he thinks little. Perhaps he is apt to be tired from much operating; perhaps it is the traditional curse of the barber pole and short coat.

But these are not all of the specialties. The clinical psychologist has come into the field and revolves about the nervous system too, following psychiatry like the tail on a comet. The neuro-radiologist has joined our clinical constellation, and he brings us exact means of analysis of the nervous system. Basic scientists no longer influence us from a distance. The neurophysiologist has moved into our clinics to stay. His electroencephalograms provide us with a completely new formula for study. The neuro-anatomist, the neuropathologist, the neurochemist, the experimental psychologist—all are most welcome to join our ranks. With their help we now look forward to the future with high hope.

SCIENCE

Men talk gravely of atomic and bacterial Armageddon, of total death and destruction that may come to us on the "shining wings of science". Millay has penned an "Epitaph for the Race of Man". She speaks of a time to come—

> " . . . . . when the plain
> Round skull of Man is lifted and again
> Abandoned by the ebbing wave, among
> The sand and pebbles of the beach,—what tongue
> Will tell the marvel of the human brain?
> Heavy with music once this windy shell,
> Heavy with knowledge of the clustered stars;
> The one-time tenant of this draughty hall
> Himself, in learned pamphlet, did foretell,
> After some æons of study jarred by wars,
> This toothy gourd, this head emptied of all."

Call this a flight of fancy, if you like. But we must see the menace of external science. We

should see also that ours is an internal science which, although it is just beginning, offers man hope of sanity and of salvation.

I have said that the nervous system is more important than the other systems of the body. Certainly it is the most complicated. The splitting of the atom was child's play as compared with our task of charting the mechanisms of the central nervous system, mechanisms upon which thought and behaviour must depend.

CANADIAN NEUROLOGICAL SOCIETY

This is the inaugural dinner of the Canadian Neurological Society. My conception (and, I hope I may be permitted to say, our conception) of neurology is that it should include all the disciplines enumerated above. We should welcome to the deliberations of this Society any who would study the nervous system seriously, both clinicians and basic scientists.

When we learn more about the physical mechanisms of the mind, the psychiatrist will feel the force of gravity. Then, I predict, he will rejoin our company and find some of the things he is seeking. Meantime, we realize that the psychiatrist, in his own way, is pushing forward work of vast importance to the welfare of mankind.

We, however, must keep before us the conception that an understanding of the action of the brain will lead us to an understanding of the mechanisms of the mind and the causes of mental derangement. To achieve such an understanding is the task to which the workers in the broad field of neurology must set themselves.

I hope that this will prove to be a society and not an association. A society is a body of companions. In our case the companions are drawn together by a common interest. We have a common need for intellectual stimulus. I hope that this companionship will broaden into common friendships which man and wife may enjoy together.

Allegiance to this society should in no way interfere with our attendance at the Canadian Medical Association meetings. If the two meetings are synchronized, we will be able to play our proper rôle in the neurological education of Canadian physicians. Even surgeons may thus come in time to realize that there is something of importance going on beneath the dura mater!

OSLER

If Sir William Osler were alive today, we would be looking forward to the celebration of his one hundredth birthday on July 12 of this year. Long life was in his genes. His mother rounded the century quite easily, but he died thirty years ago.

It is fitting that he should be in our thoughts all through this year. But I should like to do something more. I should like to bid him speak to you through me. Surely I am the only man in this new-formed society who can claim to be his pupil. At least, I am the only pupil of the first order. Many of you must be pupils of the second order.

Thirty years ago, in Oxford, I watched them bear the body of Osler across the quadrangle and into Christ Church chapel. Seated in a dark corner of the chapel, I leaned against the cold stone with a feeling of great loneliness, remembering at how many points my student life had touched his and recalling the man to mind. I do so tonight, but with no sense of loneliness.

If Osler were here with us tonight (and perhaps he is), he would be delighted at the birth of this society. He would probably call it the coming-of-age of Neurology in Canada.*

Specialization is necessary in the present stage of medical evolution. Some may be tempted to call it a necessary evil, but it will never seem evil in the specialist who continues to be a good physician. Great learning is good but it can never compensate for a loss of understanding and of sympathy. And that brings us to the training of specialists in general and the training of neurologists in particular.

The problem is to produce a really first rate clinician whatever may be his special interests. Let me therefore give you an example of a preparation that succeeded.

BASIC SCIENTIST

In 1874, the Professor of the "Institutes of Medicine" at McGill died suddenly. His work, and shortly afterwards his chair also, was handed on to one William Osler, aged 25. The "Institutes of Medicine," in the Edinburgh tradition, included histology and physiology. Shortly after accepting the Professorship, he also became pathologist to the Montreal General Hospital, the first pathologist, for, up to that time, each physician and surgeon had carried out himself such autopsies as were done upon his own patients. But Osler, in his zest for work, did the examinations for all the rest.

This young man, who had been a botanist before he entered medicine, concentrated his attention upon the biological sciences—physiology, histology and pathology. He gathered into his own strong arms the responsibility for nearly all of the fundamental work being done in the university at that time. It was these years of hard labour at basic science that prepared him to be the most brilliant clinician of his day.

That was 75 years ago. Times have not changed. There is no short cut, no better method of making an internist or a neurologist or a neurosurgeon. Young men who are fired

* Osler referred to the inaugural meeting of the Association of American Physicians in 1886 as the coming-of-age of internal medicine in America.

with desire to study for themselves the facts upon which the structure of medicine has been built, should be encouraged to step out of the rank and file of medical education and lose themselves in similar work for a while. This experience will change them fundamentally. They will never rejoin the rank and file. They are the stuff that good specialists are made of.

In the beginning, Osler had only the will to work. He had imagination, and a love for his fellow men. He was not gifted as a speaker, or a writer, or an experimenter. These things he developed only by hard work. Perhaps I can illustrate this fact by giving you his own words at different stages in his development, for in the pattern of a man's words one may read the quality, the breadth and the depth of his thinking.

With the passing of these early years Osler became a clinical observer and a teacher without peer, but he made no fundamental advances in basic science. It might be said that any scientist who becomes a clinician forfeits the possibility of making historic discoveries. The discoverer of insulin was not a clinician. The best a clinician can do is what Osler did do, and yet Osler's name is likely to be forgotten long before that of Banting.

LITERARY EVOLUTION

As we all know, Osler developed a brilliant literary style and made of himself a scholar in medicine. But this came very slowly, as is shown by the following extracts from his speeches:

"Gentlemen of the graduating class, the pleasant duty devolves upon me of offering you . . . congratulations on your present success . . ." This was the beginning of his first valedictory address, delivered to McGill graduates, when he was 25 years of age. "Let the spirit," he continued, "of our medical moralist, Sir Thomas Browne, whose *Religio Medici* I would commend to your perusal, actuate you."

"Commend to your perusal!" This stiff phrase is not in the simple, graceful style which he was to achieve. But he continued, no doubt with beads of perspiration on his forehead:

"You may feel aggrieved and think yourself wronged or slighted; instead of giving vent to your feelings on such occasions, restrain them and remember the injunction: 'If thy brother trespass against thee; go and tell him his fault between thee and him alone; if he shall hear thee, thou hast gained thy brother'. . . . A word now on the Temperance question which is becoming an all-important one in Canada for us as medical men. That alcohol is a medicine, and a valuable one, nobody not blinded by prejudice denies. Example, gentlemen, is better than precept, and by becoming teetotallers yourselves you will neither injure your health nor damage your professional prospects. . . . In conclusion, gentlemen, let us hope, that wherever you go you will maintain the good name of your Alma Mater, and add to the lustre which surrounds her. Bend all your energies to the attainment of proficiency in your calling; work while it is yet day, that when your night comes it may be said of you as of Gerard de Narbon, one of Shakespeare's physicians—'He was in what he did profess, well found' ".

The form of this first oration as well as its content suggests the continuing influence of his early school teacher, "Father" Johnson, and the maxims, perhaps, of his own father in the parsonage which was his home at Bond Head and Dundas. William Osler was a preacher, as well as a teacher, from the beginning. But as time passed he learned to tincture advice with humour and understanding.

Ten years later, after accepting a call to the Chair of Medicine in the University of Pennsylvania, Osler gave his introductory lecture in Philadelphia, aged 35, a lecture which has never been published, but which Dr. William Francis kindly placed in my hands in the Osler Library, with permission to use it for the purposes of this address. I have copied some excerpts from Osler's longhand notes as follows:

"In the race, gentlemen, upon which you enter today, success or failure, as the case may be, will depend very much on the life which is now behind you. If you have been idle, and wasteful of your time at school, it will be hard to acquire industrious habits here. Bury the past and start afresh today with the firm resolve to waste not an hour of the short and precious time which is before you. . . .

"Beautiful and enticing as is the study of Anatomy, we cannot see its full beauty until in Physiology we study the relation of structure to function. . . . Above everything, gentlemen, come to the study of the diagnosis of disease with all the modesty at your command. Positiveness and dogmatism are inevitable associates of superficial knowledge in medicine. We so long for certainty in this changing world, and the younger we are the more we seem to need it.

"The motto of each of you as you undertake the examination and treatment of a case should be 'put yourself in his place'. Realize, so far as you can, the mental state of the patient, enter into his feelings . . . scan gently his faults. The kindly word, the cheerful greeting, the sympathetic look. . . .

"Bear away with you to your work the spirit of my text which I give you last on purpose: 'The knowledge which a man can use is the only real knowledge, the only knowledge that has life and growth in it and converts itself into practical power. The rest hangs like dust about the brain or dries like raindrops off the stones'."

Dr. Francis has pointed out that at the end of the address occurs this tentative final paragraph:

"The transplantation of a man, as of a tree, is a risky process and not always successful. Under the changed conditions a fresh growth does not inevitably take place. I trust, Sir, that in my case, if the flowers and fruit are not apparent, you can at any rate see 'the tender leaves of hope'."

This paragraph was struck out and below it his cousin, Miss Jeanette Osler (1839-1936) who was his devoted admirer and helpful critic, had written, probably years after the reading:

"I do not like this; you were beyond all they could hope for when you came, and to speak of 'tender leaves of hope' in your case savours of the pride that apes humility, though I know nothing is farther from your nature, but everyone does not know you so well."

She followed this with a new version of the paragraph which she herself had evidently composed.

This lecture has fresh charm and enthusiasm. It had never been reworked for publication, and is therefore the more interesting.

During the five years in Philadelphia, Osler found much use for the "ink pot", and at the end of the period his Valedictory Address reflects intellectual maturity. It would not do for a Montrealer to suggest that this was the effect upon him of the culture of that city. There is depth of understanding and he has achieved simplicity of expression. What a contrast between this and his first valedictory address in Montreal, in style, polish, humour!

"It is my duty," he began, "to say a few words of encouragement and to bid you in the name of the Faculty, God speed on your journey. I could have the heart to spare you, poor careworn survivors of a hard struggle, so 'lean and pale and leaden-eye' with study; and my tender mercy constrains me to consider but two of the score of elements which may make or mar your lives—which may contribute to your success, or help you in the days of failure.

"In the first place, in the physician or surgeon, no quality takes rank with imperturbability, and I propose for a few minutes to direct your attention to this essential bodily virtue. Imperturbability means coolness and presence of mind under all circumstances, calmness amid storm, clearness of judgment in moments of grave peril, immobility, impassiveness, or, to use an old and expressive word, phlegm. It is the quality which is most appreciated by the laity though often misunderstood by them. . . .

"Cultivate, then, gentlemen, such a judicious measure of obtuseness as will enable you to meet the exigencies of practice with firmness and courage, without, at the same time, 'hardening the human heart by which we live'.

"In the second place, there is a mental equivalent to this bodily endowment, which is as important to our pilgrimage as imperturbability. Let me recall to your minds an incident related of that best of men and wisest of rulers, Antoninus Pius, who, as he lay dying, in his home at Lorium in Etruria, summed up the philosophy of life in the watchword, *Æquanimitas*. . . ."

In the paragraph which now follows I seem to detect a slight savouring of rebuke, for the youthful professor had learned to know what it was to be patronized in the "city of brotherly love".

"While preaching to you a doctrine of equanimity, I am, myself, a castaway. Recking not my own rede, I illustrate the inconsistency which so readily besets us. One might have thought that in the premier school of America, in this Civitas Hippocratica, with associations so dear to a lover of his profession, with colleagues so distinguished, and with students so considerate, one might have thought, I say, that the Hercules Pillars of a man's ambition had here been reached. But it has not been so ordained, and today I sever my connection with this University."

"Gentlemen,—Farewell, and take with you into the struggle the watchword of the good old Roman—*Æquanimitas*."

William Osler, born in an obscure Ontario village 100 years ago, found in basic medical science the key to clinical vision. It was no accident that placed him successively in the chair of medicine of four of the world's medical capitals. He was a simple man, a good Canadian, great in heart and great in mind.

The members of this newly formed Canadian Neurological Society could do no better than to inscribe his name, *honoris causa*, with theirs in the roll of founder members. Finally, let me persuade you that, through me, he gives you his blessing as you launch this society, and wishes "God speed" to its meetings through the years.

OSLER—A PERSONAL TRIBUTE*

H. P. Wright, M.D.

Montreal, Que.

William Osler was born on July 12, 1849, the youngest son of nine children, in a rectory, which, he always said, was the best of all possible birthplaces. He was educated at Trinity College School and at Trinity College, Toronto, and while at the latter institution he wrote to his mother of his intention to enter the ministry. Her reply expressed gratefulness that one of her six sons should do so, but advised him to reflect seriously before making such an important decision. This letter must have coincided with his first contact with Sir Thomas Browne's "Religio Medici", which he purchased in 1867, for it was about this time that he chose medicine as his career rather than the ministry.

In appearance and mental sensitivity Osler resembled his mother—and she was a remarkable woman. Some of those present today will recall her parting advice to her youngest son in 1905, when he was leaving the noisy, busy corner in Baltimore for what he thought would prove the more restful atmosphere of Oxford: "Remember, Willie, the shutters will rattle in England as they do in America." For Osler in Oxford the whole house rattled. But this is to anticipate.

Osler graduated in medicine at McGill in 1872. He spent two years abroad and then returned to Montreal, at the invitation of Dr. Robert Palmer Howard, to be lecturer in the Institutes of Medicine. He was later Registrar, and while at McGill he was probably responsible for the initiation of an inaugural lecture which used to be given in the autumn to all the medical students, and which I, as a small boy,

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* Address delivered at McGill University on October 6, 1948, at the annual ceremony connected with Dr. Grant Stewart's bequest, at which the second-year medical students are presented with Osler's "A Way of Life".

remember my father, on one occasion, travelling to Montreal to deliver.

After ten years on the faculty of McGill, Osler went to Philadelphia where he remained for five years, after which he spent sixteen years at Baltimore, going finally to Oxford for the remainder of his life.

It was in Baltimore that he wrote the textbook which he dedicated to his three teachers:

William Arthur Johnson
Priest of the Parish of Weston, Ontario, (*and naturalist*)

James Bovell
of the Toronto School of Medicine and of the University of Trinity College, Toronto,
(*theologian and physician*)

Robert Palmer Howard
Dean of the Medical Faculty and Professor of Medicine, McGill University, Montreal,
(*the ideal student practitioner*)

In 1892, Osler married the right woman. The tempo increased with the busy life at Number 1 West Franklin Street and at the Hopkins, and it is usually conceded that this period was the peak of his active medical career.

In any event, Egerton Yorick Davis was busy, and he needs some explanation. Barrie had his M'Connachie, Dr. Jekyll his Mr. Hyde, and Osler his Egerton Y. Davis. In a short address it is impossible even to refer to the multitudinous activities and contacts which Osler made, but it seems to me worth while, with the time at my disposal, to try to explain the relationship between Dr. Osler and Dr. Egerton Yorick Davis. You are all probably familiar with the famous quotation: "De mortuis nil nisi bonum". For Osler it became: "De hominibus nil nisi bonum". (Say nothing about anyone, either living or dead, unless it is good.) A hard and, I would say, an almost impossible rule for any human being to hold. Osler succeeded, but E. Y. Davis was the fantastic result.

When his first son, Paul Revere Osler, died a week after his birth, the father wrote: "I whistle that I may not weep"—and he was a great whistler. The letter that was postmarked "Heaven" and written by Osler but signed "Paul Revere Osler", to his mother, shows Osler's concern and also his deep desire to comfort his wife.

But there were many difficulties to meet, *and complexes will not be repressed.* The result was whistling, and, when this did not suffice, practical jokes. To give three examples only: The first was told to me by Dr. A. D. Blackader, a fearsome therapeutist but a beloved pædiatrician. In the early '90's, the American Pædiatric Society was meeting in Montreal, and Dr. Blackader was entertaining at dinner Professor Rotch, of Harvard, and others. Dr. Rotch was the Bostonian who introduced percentage feeding for artificially-fed infants. Pure certified milk was prescribed from the Walker-Gordon Laboratories. For example: one day, fat: 2.1%; carbohydrates: 4.3%; protein: 1.5%, etc., and the prescription was changed from day to day for the poor sick babies—a method which has long since been forgotten but which, at the time, seemed very important to the Bostonians and their disciples. One can imagine Osler's annoyance at what to him, as a wise physician, would probably have seemed sheer impractical lunar therapeutics. He burst in and changed the conversation, as he often did when it was not to his liking, and told the gathering, at great length, of a nearby ideal village, with a perfect child-welfare health centre, where the artificially-fed infants were all nourished on certified milk, and the social conditions were faultless. The name of the place was Caughnawaga, and he described minutely how to drive by cab to Lachine and hire a boat to row across the river to this jewel in the wilderness. Rotch, with his wife, followed out Osler's instructions next day, and eventually arrived at the obscure Indian village which went by the name of Caughnawaga. Naturally enough, Rotch never forgave Osler. Egerton Y. Davis, M.D., often registered from Caughnawaga. Osler himself wrote: "Once, at Atlantic City, after I had broncho-pneumonia, I registered under that name immediately after Mrs. Osler and Revere. I had been there a week when a man came up and said: 'Are you Dr. Osler? I have been looking for you a week. Your secretary said that you were away and not to be got at. My son is ill here and I wished you to see him.' He had said to Cadwallader Biddle: 'Who is that fellow, Davis, always with Mrs. Osler?' and was furious when he found that I had registered under that name."

The second example is the well-known story of the young nurse who was carrying a dinner tray through the corridors of Hopkins. Osler stopped her, put sugar in the soup and on the meat and vegetables, and sprinkled salt and pepper generously on the dessert. Because it was the beloved Chief, the nurse was amused and returned for a new tray. One wonders whether one of his patients had proved to have some fatal disease, or perhaps one of his assistants had done something quite contrary to his standard of fitness.

My final example is of less significance, but it illustrates his methods of correction. He disliked garrulity and pomposity, and, as is well known, some doctors, as they become successful, incline towards both. Osler was wont to go up to them, put his left hand in their right one and say: "You are a dear good fellow, but you want to watch out; you're getting fat." And then, with his right hand he would give them a mild "klapversak" in the

abdomen. (For the benefit of the laity, this means a "poke in the belly".) Osler's practical jokes were all explosions, performed by his *alter ego* without malice.

In the Baltimore era, as has been mentioned, Osler had become a world-famous physician, and it is, therefore, appropriate to try to appraise his character in which there seemed to be three predominant qualities: (1) He was a lover of mankind. (2) He had a great sense of humour. (3) He had a high sense of honour. True, his original work in medicine is not great and he is chiefly remembered for his work with blood platelets and the Osler-Vaquez disease, but all his effort was a preparation for one thing: *To be a consultant hospital physician, and to teach students and young doctors how to care for the sick.* He was human and he therefore made mistakes of the head, but never mistakes of the heart. In his farewell address to the profession of the United States and Canada, on May 20, 1905, he said:

> "I have had three personal ideals. One, to do the day's work well and not to bother about tomorrow. It has been urged that this is not a satisfactory ideal; it is, and there is not one which the student can carry with him into practice with greater effect. To it, more than to anything else, I owe whatever I have had—to this power of settling down to the day's work, to the best of one's ability, and letting the future take care of itself.
>
> "The second ideal has been to act the Golden Rule, as far as in me lay, towards my professional brethren and towards the patients committed to my care.
>
> "And the third has been to cultivate such a measure of equanimity as would make me bear success with humility, the affection of my friends without pride, and to be ready, when the day of sorrow and grief came, to meet it with the courage befitting a man."

As is well known, Osler was always in great demand, and he was offered many high positions—as, for example, the Principalship of McGill University and the Presidency of Toronto University—but his mind was set on being a good doctor and he never swerved from that ideal.

Something must also be said of Edward Revere Osler, his beloved son, who was killed in France on August 29, 1917. Revere's library was sent to Hopkins, except for Osler's original 1862 copy of "Religio Medici", of which Sir William himself wrote: "The Browne bought in 1867 is the father of my Browne collection. In it is a touching association as in this volume only, in this section of the library, is found the bookplate of my boy, his own design and etchin. He claimed it for his lifetime, promising that it should join the collection at his death." Osler never recovered from the blow of his boy's death, and he could not whistle it off, or deputize Egerton Y. Davis to treat the wound. He suffered in the same uncomplaining manner as thousands of other parents, but the nights were bad, and he lost twenty pounds in a year.

Osler loved students and he loved books. McGill medical students are fortunate in that they all receive a copy of "A Way of Life" in their second year, and, on graduating, one of "Æquanimitas", and, in addition, one especially selected student is given a copy of "The Life of Sir William Osler" by Harvey Cushing.

We live in a changing world and medicine changes with it. Our knowledge is constantly enlarging. "A Way of Life" was written thirty-five years ago in the horse-and-buggy days of the general practitioner. Today, automobiles, flying machines, x-rays, laboratories, biophysics, atomic bombs, have revolutionized the pattern of living. In Britain, state medicine is on trial, and in the United States, group practice is becoming common. Osler said: "In every town of fifty thousand inhabitants, a good model clinic could be built up if only a self-denying ordinance were observed on the part of the profession."

Whatever the future holds for those engaged in the practice of medicine, the Osler message is still vital, as it carries that sweet, optimistic, courageous note which makes one glory in the day's work.

On May 16, 1919, as President before the Classical Association at Oxford, Osler delivered his last address; the title was: "The Old Humanities and the New Science"—a plea for a closer relation between the humanities and science. It was on this occasion that he paraphrased Mark Twain's comment on Christian Science, and said: "The so-called humanists have not enough science, and science sadly lacks the humanities." Is the answer possibly a new prophet from Oxford who has recently come to the fore? I refer, of course, to the philosopher-historian, Arnold J. Toynbee, and I commend to you his works, more particularly the thirteen essays entitled "Civilization on Trial".

I cannot close without paying tribute to Grace Revere Osler. She, too, was a great person, and she carried on bravely, in the Osler spirit, until death relieved her just before the books were to leave Oxford for McGill. Let us honour and pay tribute to them both!

And I end with a joyous note, for in earlier days (and Toynbee makes one thousand years a hundred) they might have been called "Saint William" and "Saint Grace", and their epitaph might have been:

> Here lie we, William and Grace Osler.
> Have pity on our souls, Lord God,
> As we would do were we Lord God
> And ye were William and Grace Osler.

Their spirit liveth in the Osler Library!

THE LIGHTER ASPECTS OF OSLER'S TEXTBOOK

H. E. MacDermot, M.D., F.R.C.P.[C.]

Montreal, Que.

In the nature of things it is impossible to write a textbook of medicine which will not become obsolete, sooner or later. And, also in the nature of things, it is extremely difficult to write one in which the technical material is presented in so lively an atmosphere as is found in Osler's textbook. So difficult is it that it has not been done in nearly fifty years, and, with the changing face of medicine it seems less and less likely ever to be done again.

What textbook, for example, has ever provoked verse, even if it be doggerel; or has tempted anyone to set an examination paper on its lighter side; or has been the source for the game of "Consequences"?

O none! save only Osler's miracle of art
That flowed so freely from his head and heart!

The verses on the textbook appeared in 1909, in the *Guy's Hospital Gazette,* over the signature "S.S." (S. Brockhouse). A few of the verses only will be given, as many of the allusions are local.

The Student's Guide to Osler*

It isn't so much that it's brainy,
Although it's undoubtedly that,
I'm not eulogistic because each statistic
Comes out so impressively pat—
It's all for the sake of the stories
He tells with a vigour so rare;
No poisonous bloater has dogged Minnesota,
But goes to posterity there.

. . . . . .

Hippocrates gaily discourses
Of Erysipelatous lore,
And tells what the sight is of peritonitis
For those who've not seen it before.
Pneumonia spurred Aretaeus
To study its devious laws,
Which object titanic was followed by Laennec,
Till Fraenkel discovered the cause.

. . . . . .

But dearest are those to you, William,
Who shed in impetuous pars
Their knowledge like manna beneath the bright banner
That glows with the Stripes and the Stars.
Gerhard, Cushing, Fitz, and Weir Mitchell,
We honour, but what of each name
That you print till they're more than the sands of the shore
And equally worthy of fame?

For why should it matter to usward,
If Osborn has sent you a screed,
Or why have you sought a brief mention of Porter,
Or Barker, or Caton, or Reed?
I sometimes am seized with a yearning,
In Appleton's ledger to look,
What fun it would be if we only could see
Whether each of them purchased the book!

But when of the names we are weary
(Directories muddle the brain),
We're provided by you with philosophy too
In the trite Aphorisms of Cheyne.
Geography also you teach us,
Until I came under your thrall,
I don't mind confessing that Conoquenessing
I never had heard of at all.

. . . . . .

What fun when the "Western Physician,"
With colic and devious doubt,
His judgment upsetting, insisted on getting
His blameless appendix cut out!
What pathos and woe when the extern
Came down the proud father to tell
That bouncing young Barney, the fifteenth Morgagni,
Was born with the jaundice as well!

. . . . . .

And now you are with us at Oxford
You've plenty of leisure, no doubt—
So make I petition, another edition,
And leave the Pathology out;
Cut symptoms and treatment, and give us
More tales, repartees, epigrams,
It would leave the whole screed more amusing to read,
And quite as much use for exams!

* From *Guy's Hospital Gazette,* October 2, 1909.

The examination paper was really a very clever skit. Osler was highly amused with it, but even he had trouble in placing all the references; one he could not identify at all. Apparently a complete set of answers came from Dr. J. W. White of Philadelphia, in 1902, but these have been mislaid. Another set of answers had also been worked out, though not so completely, by Wyatt Johnston, Osler's successor as pathologist at the Montreal General Hospital. Johnson had apparently amused himself with it, without saying anything to anyone else, as his answers were only found amongst his papers after his death.

The questions as shown below were published in the *St. Thomas's Hospital Gazette* in 1902, and republished in the same Journal in 1907 with what the editor called "some interpolations by American scholiasts". But actually it was Osler himself who suggested the additions. They are marked with an asterisk in the following. The answers, which are in the Osler Library have been provided by Dr. W. W. Francis.

AN EXAMINATION PAPER ON OSLER
(4th EDITION)

Therc seems to be a certain monotony about medical examinations, so we suggest the following, by way of variety:

1. Who was Mephibosheth? What parental superstition dates from his time?
2. What is "one of the saddest chapters in the history of human deception?"
3. Give Osler's quotations from the following authors: John Bunyan, Byron, John Cheyne, George Cheyne, Montaigne. Explain the context where necessary.
4. Describe, if necessary with the aid of diagrams, Kemp's double current rectal tubes. What are the indications for their employment?
5. Give in full the name of "the distinguished old Bath physician". At what period did he flourish, and what is his claim to distinction?

6. As a sequence to what therapeutic procedure did the son of Professor Langerhans die? What was the pathological and medico-legal interest of the case?
7. What is the chief recorded complication of a lay committee meeting at St. George's Hospital?
8. Who was convinced that more wise men than fools are victims of gout? Is there any reason why he, in particular, should hold that view?
9. What cases drift to "museums and side-shows"?
10. How did Trousseau's patient make money?
11. What celebrated English physician preferred to die in harness? State the cause of death?
12. What internal evidence is there:
    (*a*) That Osler has had an unhappy experience with cheap bicycles:
    (*b*) That he is interested in the history of Napoleon Buonaparte?
13. What is O. Rosenbach's dictum on the custom of wearing stays?

*14. Quote Hunter's famous advice to Jenner.

*15. What was the counsel of Rondibilis to Panurge?

*16. How did Eryximachus treat the hiccough of Aristophanes?

*17. Give the references to Lady Mary Wortley Montagu, President Jefferson, Jerome Cardan, the Elder Scaliger, Captain Catlin, Laurence Sterne, Thomas King Chambers, Robert Druitt and Colonel Townshend.

*18. What did Strabo call "the lisping of the gout?"

19. Give the context of the following quotations, and make explanatory remarks if necessary:
    (*a*) Cases are given after nearly every one of the specific diseases.
    (*b*) I saw, some years ago, one of the most distinguished gynæcologists of Germany perform laparotomy in a case of this kind.
    (*c*) The doses given by the late Alonzo Clark, of New York, may be truly termed heroic.
    (*d*) In a somewhat varied post-mortem and clinical experience, no instance has fallen under my observation.
    (*e*) A history of gorging with peanuts.
    (*f*) I have seen Murchison himself in doubt.
    (*g*) A toad-like caricature of humanity.
    (*h*) From the accurate view of Laennec and Louis the profession was led away by Graves, and particularly by Niemeyer.
    (*i*) One of the most powerful enemies of the American stomach at the present day.
    (*k*) I had a lesson in this matter which I have never forgotten.
20. Who was Van Helmont, and when did he live? Give a brief account of his opinion on contemporary medicine.
21. Who made an autopsy on Dean Swift, and what did he report?
22. What interest attaches to:
    (*a*) The Pullman car conductor from Chicago.
    (*b*) The Appleton-Swain family.
    (*c*) Yellow cakes at Philadelphia.
    (*d*) Chancellor Ferrier.
    (*e*) Master McGrath.
    (*f*) Renforth the Oarsman.
    (*g*) Shattock's patient.
23. Who had a translucent head? What was the pathology of the condition?
24. On what occasion was a surgeon entrapped by a neurotic physician?

D.M.S.*

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* From the *St. Thomas's Hospital Gazette*, London, March, 1902.

"D.M.S." stands for L. S. Dudgeon, A. Mavrogordato, and S. G. Scott.

ANSWERS

. . . W. Johnston supplied 38 of these, and I have added 8 others, leaving six references still to be found, namely, No. 4, "Kemp's double current rectal tubes", which, if I remember rightly, always mystified Osler himself; No. 10; No. 17, "Druitt" and "Townshend"; and No. 19, (*a*) and (*b*).—(W.W.F.)

1. p. 942: "Mephibosheth", son of Jonathan, dropped by the nurse, infantile paralysis, 2 Sam. 4: 4.
2. p. 1111: Salem witches, epidemic hysteria.
3. p. 108: Bunyan, "Captain of the men of death"—now pneumonia, applied by B. to consumption.
   p. 439: Byron, obesity, an "oily dropsy".
   p. 751: John Cheyne, "For several days his breathing was irregular . . ." Cheyne-Stokes.
   pp. 439 and 470: Geo. Cheyne, his 13th aphorism, paraphrased by Osler to "We eat too much after forty".
   p. 893: Montaigne, "Thou art seen to sweat . . ." attack of renal colic described.
4. p. ?: "Kemp's double current rectal tubes" (not found. On p. 545, "Kelly's long rectal tubes").
5. pp. 836-7: Caleb Hillier Parry, described exophthalmic goitre in 1786 (published 1825).
6. p. 827: preventive dose of diphtheria antitoxin. Sudden death in "status lymphaticus", persistent thymus.
7. p. 761: Death of John Hunter from angina.
8. p. 414: Sydenham, who had gout himself.
9. p. 930: "Living skeletons" in museums and side-shows, progressive muscular atrophy.
10. p. ?: Trousseau's patient (not found).
11. p. 785: Hilton Fagge "died in harness" of aortic aneurism.
12. (*a*) p. 771, l.2: Familial arteriosclerosis, "bad material was used for the tubing".
    (*b*) Napoleon; p. 759: pulse of 40; p. 1100: epilepsy.
13. p. 792: "The 'corset and chlorosis' expresses O. Rosenbach's opinion."
14. p. 69: Hunter to Jenner, "Do not think, but try. . . ."
15. p. 252: Rondibilis to Panurge, "hard work", in prophylaxis of syphilis.
16. p. 1069: Eryximachus, "Tickle your nose . . . and sneeze . . .".
17. p. 56: Lady Mary, inoculation;
    p. 69: Jefferson, vaccination;
    p. 414: Cardan's and Scaliger's terrible gout; p. 414 (also) Cardan on calculi in gout;
    p. 640: Sterne, venesected for hæmoptysis;
    p. 777: Chambers, multiple aneurysms;
    p. ?: Robert Druitt (1814-83, surgery, housing, drinking water, reference not found);
    p. ?: Colonel Townshend (is this George T. 1724-1807, who commanded at Quebec after Wolfe's death? Reference not found).
18. p. 415: hot or itching feet, Strabo's "lisping of the gout".
19. (*a*) p. ?: "Cases . . . after nearly every one of the specific diseases" (reference not found).
    (*b*) p. ?: German gynæcologist (reference not found—distended bladder? the hysterical tumour at foot of p. 1114 is something like it).
    (*c*) p. 607: Clark's "heroic" doses of opium in acute peritonitis.
    (*d*) p. 551: "No instance", acute yellow atrophy.
    (*e*) p. 524: "Gorging with peanuts", appendicitis in boys.
    (*f*) p. 52: "Murchison himself in doubt", diagnosis of typhus.
    (*g*) p. 843: "Toad-like caricature", myxœdema.
    (*h*) p. 302 Laennec and Louis *vs.* Graves and Niemeyer, hæmoptysis in tb.
    (*i*) p. 471: "enemy of American stomach", soda-water fountains.
    (*k*) p. 48: "lesson . . . never forgotten", solid food after typhoid.

20. p. 135: J. B. van Helmont (1577-1644) against the "Bloody Moloch" of bleeding.
21. p. 1029: Mr. Whiteway opened Dean Swift's skull "and found much water in the brain".
22. (*a*) p. 57: Pullman conductor started smallpox epidemic in Montreal.
    (*b*) pp. 819 and 821: Appleton-Swain family, bleeders for 2 centuries.
    (*c*) pp. 186 and 1035: poisoning by yellow cakes, chromate of lead.
    (*d*) p. 758: Ferrier (of McGill) aged 87, extremely irregular pulse for 50 years.
    (*e*) p. 742: Master McGrath, racing greyhound, hypertrophy of heart.
    (*f*) p. 635: Renforth the Oarsman, died in a race, from alleged congestion of the lungs.
    (*g*) p. 546: Shattock's patient, "intestinal sand".
23. p. 1029: Translucent head, Cardinal, Bright's case of hydrocephalus.
24. p. 529: Pseudo-appendicitis. "What fun when a 'Western physician,' with colic and devious doubt His judgement upsetting, insisted on getting His blameless appendix cut out."—(Brockhouse.)

Finally, someone compiled the following list of "Consequences".

TALES FROM OSLER*

1. Consequences

The notorious Duchess of Cleveland met
my good friend Evans
in a farm house so constructed as to shut out the sunlight and fresh air, and the vestibule was thoroughly screened. The average temperature for sixty-three days was about 76° F.
She had—a sharp nose, hollow eyes, collapsed temples; the ears cold, contracted, and their lobes turned out; the skin about the forehead being rough, distended, and parched; the colour of the whole face being brown, black, livid or lead coloured.
He was—ruddy in countenance, but especially the cheeks; the white of the eyes very bright and fatty; the point of the nose flat; the veins in the temples and neck distended.
She wore—a rickety rosary.
He wore—a light flannel cape about the shoulders.
He said to her: "Persons over 40 eat too much."
She said to him: "Deception may be practised."
He said: "Das Blut ist ein ganz besonderer Saft."
She retorted: "Shut your mouth!—and save your life."
He gave her—a good big bottle of paregoric.
She gave him—three sardines à l'huile.
The Consequence was—she shocked her mother and friends by constantly using the word damn.
And the world said: "The Governor of the State of San Francisco showed an amazing stupidity, shared by not a few physicians who should have known better."—(4th ed., p. 192, *Diagnosis* of "Plague", here paraphrased from W. O.'s "Governor of the State refused . . . . ."—W.W.F.)

* *St. Thomas's Hospital Gazette*, vol. 17, 1907.

It would be some advantage to live a primitive and frontier life, though in the midst of an outward civilization, if only to learn what are the gross necessaries of life, and what methods have been taken to obtain them. —Thoreau.

MEDICAL SOCIETIES

Canadian Urological Association

The first independent meeting of the Canadian Urological Association was held in Montreal on April 19 and 20, the sessions were attended by 55 out of a total of 92 members. Guests were present from both the New England and Northeastern Sections of the American Urological Association. Three of the four scientific periods were devoted largely to the study of basic sciences as applied to urology. Well known scientists from McGill and the University of Montreal were freely utilized. At each of these periods there were presented also two short clinical papers by members of the society. The subjects received were renal and testicular physiology and amino acid metabolism. The fourth session was devoted entirely to the study of bladder neoplasm. The correlation of didactic and clinical material proved to be highly successful and will probably serve as a pattern for future meetings of this Society. An active social program for both members and their wives occupied the leisure hours of each day.

The executive for the coming year will be: *President*—J. C. MacClelland, Toronto; *Treasurer*—J. P. Bourgeois, Montreal; *Secretary*—S. A. MacDonald, Montreal.

Lincoln County Medical Association

The Lincoln County Medical Association held their Spring Clinical Day at the Hotel Leonard, St. Catharines, Ont., on May 11, 1949. A new idea was tried in having only one subject thoroughly discussed by an outstanding clinician and teacher. The subject chosen was "The Peripheral Vascular Diseases" and the Speaker was Dr. Robert R. Linton, Associate Professor of Clinical Surgery, Harvard Medical School; Chief of the Vascular Clinic, Massachusetts General Hospital. Different phases of the subject were separated by views of exhibits and by a luncheon. The exhibits included several from the hospitals of Buffalo.

NOBLE SHARPE

Quebec Association of Pathologists

The Fourth annual meeting of the Quebec Association of Pathologists under the chairmanship of the President, Dr. L. C. Simard, was held at the University of Montreal on May 20 and 21, 1949. There was a large attendance of members and visitors, the latter including Drs. Lionel and Klotz of the Ontario Association of Pathologists. The chief address of the scientific program on benign tumours of the peripheral nerves was delivered by Professor Pierre Masson of the University of Montreal. Papers were presented by Drs. Simon Lauze, Douglas Waugh, Sidney Kobernick, Theo. R. Waugh, Morris A. Simon, J. E. Pritchard, Sergio Bencosme, Alphonse Bernier, W. H. Mathews, F. W. Wiglesworth, Pierre Masson, J. E. Morin, Roderick C. Ross and Bonenfant.

At the business meeting of the Association, the following were elected as officers for the current year: *President*—Dr. J. E. Pritchard; *Vice-president*—Dr. J. E. Morin: *Secretary-Treasurer*—Dr. W. H. Mathews.

Saint John Medical Society

The annual meeting of the Saint John Medical Society was held in the Admiral Beatty Hotel, May 19, Dr. Geo. White, the president was chairman. After a brief but happy business session, Dr. A. W. Trueman, president of the University of New Brunswick, delighted the large dinner gathering with his presentation of a witty address titled "The Layman looks at the Doctor" Dr. Trueman said that nobody ever spoke of a doctor with indifference.

Discussion of a doctor was always on an emotional basis. After illustrating this point with selected excerpts from various writers, the speaker went on to discuss the doctor as a citizen and hoped that the special qualifications of doctors would be more widely used at all levels in our civic, provincial and national life. Dr. Trueman as a distinguished educator felt that as a citizen the physician had much to offer his neighbours besides skillful medical care. The election of officers for 1949-50 brought the following results: *President*—Dr. R. A. Gregory; *Vice-president*—Dr. T. E. Grant; *Treasurer*—Dr. John A. Finley; *Secretary*—Dr. Frank K. Stuart; *Counsellors*—Drs. Geo. White, R. T. Hayes and G. W. A. Keddy.

Winnipeg Medical Society

The annual meeting of the Winnipeg Medical Society was held in Lecture Theatre A, Medical College on May 20. The retiring president, Dr. R. A. MacPherson, gave an address on the history and development of the roentgen rays. Officers were elected as follows: *President*—Dr. T. E. Holland; *Vice-president*—Dr. K. R. Trueman; *Secretary*—Dr. S. A. Boyd; *Treasurer*—Dr. W. J. Boyd; *Trustee*—Dr. B. Dyma. Life memberships were presented to Dr. John E. Tisdale, Dr. J. C. Hossack and Dr. Alexander Gibson.

La société médicale des hôpitaux universitaires de Québec

Vendredi le 4 février, 1949.

Syndrôme de Korsakoff et alcoolisme chronique.—Geo.-H. Larue et Conrad Drolet.

Présentation de cinq malades atteints de psychoses de Korsakoff, psychose qui comporte un syndrôme à la fois neurologique et mental. Les symptômes neurologiques sont ceux d'une polynévrite. Les troubles psychiques comportent une amnésie des faits récents et un état de fabulation. Les recherches faites, au sujet de l'étiologie de cette psychose, ont démontré, qu'elle était causée par une avitaminose B. Cette découverte permet un traitement prophylactique, utile surtout chez les alcooliques chroniques, qui savent prendre quotidiennement une dose de Vitamine B, en vue d'éviter la polynévrite et les troubles mentaux.

La tuberculose à l'Hôpital St-Michel-Archange.—Louis Rousseau.

Tous les hôpitaux d'aliénés ont un pourcentage élevé de morbidité et de mortalité tuberculeuses. L'encombrement de ces hôpitaux favorise la contagion dans une certaine mesure mais il faut aussi tenir compte du nombre considérable de sujets qui sont tuberculeux à l'admission. Dans des hôpitaux américains, on évalue à 1.6% les aliénés souffrant de tuberculose à leur admission. En 1948, à l'Hôpital St-Michel-Archange, il y eut 64 mortalités attribuables à la tuberculose soit un chiffre de 1.1%. Aux Etats-Unis, la mortalité est de 0.668%. Si l'on tient compte de la mortalité générale par tuberculose des Etats-Unis et de la Province de Québec, le rapport entre la mortalité générale et la mortalité chez les aliénés de ces deux pays n'est pas discordant.

Des mesures devraient être prises pour éviter la contagion. A l'Hôpital St-Michel-Archange, tous les employés ont subi les réactions tuberculiniques et les sujets trouvés réceptifs à la tuberculose ont été vaccinés. La vaccination sera faite sous peu chez tous les malades.

Tuberculomes cérébraux.—S. Caron et A. Beaudry.

Il a été observé à la Clinique Roy-Rousseau, de mai 1946 à juillet 1948, six cas de tuberculomes cérébraux, tous rencontrés chez des adultes. L'âge moyen s'élève à 41.1. La localisation est, Protubérance: 3; Cervelet: 2; Cerveau: 1. Quatre avaient des localisation certaines tuberculeuses ailleurs dans l'organisme; deux sont morts de méningite T.B. Le diagnostic tumoral, étiologique, celui de localisation a été confirmé par l'examen histo-pathologique dans cinq cas.

L'incidence générale du tuberculome varie de 2.5 à 10% parmi les tumeurs intra-crâniennes selon les centres neurologiques ou non où il a été observé. L'homme est deux fois plus atteint que la femme. On le rencontre à un âge moyen de 31.8 ans. La localisation chez l'adulte est aussi fréquente au cerveau qu'au cervelet et toutes les localisations cérébrales sont possibles. Les éléments de diagnostic fournis par l'âge, le sexe, la localisation, tout comme par l'examen roentologique mettant en évidence des calcifications seulement dans 0.01% des cas, sont de faible valeur.

Le diagnostic est possible, à condition que chez tous les malades suspects de tumeur cérébrale, on recherche systématiquement des lésions tuberculeuses localisées ailleurs dans l'organisme, qu'elles soient anciennes ou récentes, évolutives ou non. A cette fin, tous les examens radiologiques, cliniques, bactériologiques doivent être faits avec une extrême précision.

Electro-choc et psychonévrose. — C.-A. Martin et Lionel H. Lemieux.

445 cas de psychonévroses diverses ont été traités par l'électro-choc associé à une psycho-thérapie éclectique faite en séances brèves et multipliées. Il y eut 33.5% de guérisons et 41.8% d'améliorations. La durée moyenne de l'hospitalisation fut de 1 mois et demi. Les résultats thérapeutiques sont comparables à ceux que l'on obtient par les méthodes classiques; mais la durée du traitement est considérablement plus courte.

CANADIAN ARMED FORCES

News of the Medical Services

During the month of May, Surgeon Captain A. McCallum, Medical Director General, R.C.N., carried out the annual inspection of medical facilities in the Atlantic and Pacific Commands.

Lieut.-Col. C. G. Wood, O.B.E., R.C.A.M.C., of the Directorate of Medical Services, Army Headquarters, Ottawa, and Major A. G. McLaren, R.C.A.M.C., Deputy Command Medical Officer, Western Command, were successful in passing the recent Army Staff College entrance examinations.

Major R. A. Smart, M.B., D.P.H., Royal Army Medical Corps, who spent the late winter as a member of the group of United Kingdom observers at the Army clothing and equipment trials carried out at Fort Churchill, Man., has returned to duty at the Army School of Hygiene, Mytchett, England.

One hundred and seventy-one medical students, drawn from all the medical schools in Canada, are undergoing C.O.T.C. training during the present summer. During the training periods, which vary from 12 to 16 weeks in length, the cadets receive the Army pay of 2nd Lieutenants. The first and second year students are enrolled at the R.C.A.M.C. School at Camp Borden, where they are given both general military instruction and training peculiar to the Medical Corps. The third year students are distributed throughout the various military hospitals including those integrated with Department of Veterans' Affairs hospitals, and are employed as clinical clerks.

Major C. B. Caswell, M.C., R.C.A.M.C., formerly Area Medical Officer, Saskatchewan Area, has been promoted to Lieut.-Col. and appointed to command No. 37 Field

Ambulance, which is being reactivated as a unit of the Canadian Army Active Force at Camp Borden.

The following medical officers of the R.C.A.M.C. were recently gazetted Majors: Capt. (A/Maj.) L. H. Edwards, Whitehorse; Capt. H. W. Greenidge, Ottawa; Capt. W. L. L. Bennett, Calgary; Capt. B. D. Jaffey, Kingston; Capt. J. R. Feindel, Fredericton; Capt. R. C. Elliott, Brockville.

In response to an invitation from the University of Montreal, Lieut.-Col. E. J. Young, M.D., D.P.H., R.C.A.M.C., Assistant Medical Director in charge of Preventive Medicine at Army Headquarters, Ottawa, delivered a series of lectures on Military Hygiene during May to the graduate public health students attending the School of Hygiene at the University.

The first post-war School of Aviation Medicine was recently held at the Institute of Aviation Medicine, Toronto. Thirty-two civilian medical examiners for the Department of Transport attended. The R.C.A.F. have authorized, in conjunction with the Department of National Health and Welfare and the Department of Transport, that approximately three Schools would be held yearly so that the approximately 250 civilian medical examiners in Canada may be kept abreast of the latest advances in aviation medicine. These classes will be kept distinct from those which may be held from time to time for serving medical officers. This is the first time in any country where a Service medical group has organized and conducted such a school for completely civilian medical groups. It is anticipated that the holding of these schools will be of inestimable value in future years, by producing a standard method of examination and classification of all civilian pilots and through the demonstrating of physiological aspects of flight, which will be a considerable factor in promoting safe flying.

Following a detailed survey in 1948, the R.C.A.F. Medical Branch has, in co-operation with Defence Research Board, carried out air spraying of certain units in northern areas in May and June. Under scientific control, an effort is being made to see if such air spraying will be of aid to ground control measures in endeavouring to minimize the effect of biting insects.

National Defence Headquarters has announced that the policy instituted in 1948 of subsidizing the final year for veteran medical students has been extended to cover the university year 1949-50. If selected for such a subsidy, the student will draw pay and allowances of his rank, be supplied with textbooks and such instruments as he may require during his final year, and have his final year's university fees paid by the Department. Those eligible and interested should consult the Dean of their Faculty, or make direct enquiry from the Medical Directorate of the Service of their choice at National Defence Headquarters, Ottawa.

CORRESPONDENCE

Autopsy Lung Cultures

To the Editor:

I have had some discussion and correspondence *re* the above since the publication of the article on "Staphylococcal Pneumonia in Childhood" (*Canad. M. A. J.*, **60:** 352, 1949) and for those who do not carry out cultures regularly the following emendation is necessary. Staphylococci are commonly obtained at autopsy from the bronchial surface occasionally in heavy pure culture. While I take a bronchial swab the lung surface is also seared at three or four points and a small quantity of sterile broth is inoculated into the lung substance, the needle is worked about during the injection and then fluid is aspirated into the syringe and cultured. A diagnosis of fulminating staphylococcal pneumonia is made where there are obvious signs of asphyxia and a heavy pure growth of *Staph. pyogenes* is obtained on culture; in my cases this has been obtained from all sites. Even where staphylococci are scanty in paraffin sections I have found that the lungs can be left in a sterile container for days and culture still only yields a pure staphylococcal growth, indicating that post-mortem invaders have been excluded by the action of the staphylococci. No conclusion is drawn if staphylococci are only procured from the bronchial secretion even though they may be in pure culture.

N. G. B. McLETCHIE, M.D.
Director of Laboratories

SPECIAL CORRESPONDENCE

The London Letter

(*From our own correspondent*)

AMENDING THE ACT

Mainly because of the many complexities involved in the decision to abolish the sale of medical practices, the Government had to promise to introduce an amending act. This amending Bill has now been laid before Parliament, and, so far as it goes, it rectifies some of the anomalies in the original National Health Service Act. So far as the sale of practices is concerned, the Bill is satisfactory as it incorporates the recommendations of the legal committee which has been studying this problem. This means that there will now be no prohibition on the sale of practices where required by partnership agreements in force before July 5, 1948, *i.e.*, the inauguration of the National Health Service. Of more general interest is the implementation of the Minister's promise that the Bill should contain provisions ensuring that a whole-time medical service could not be introduced by the Minister by regulation. Under the terms of the new Bill it is forbidden to require a general practitioner or a specialist to accept full-time employment. Other important features of the Bill are that in future executive councils are to elect their own chairmen instead of having them appointed by the Minister and the constitution of the tribunal which decides whether a doctor, dentist or pharmacist should be struck off the executive councils lists has been amended to allow of a wider choice of the professional members of the tribunal.

THE PENALTY OF UNDUE HASTE

This is all a move in the right direction, but there is a disconcertingly steady accumulation of evidence that we are paying a heavy price for the undue haste with which the Service was introduced. When a Judge of the High Court, in giving judgment in a case concerning a legacy to a teaching hospital, states that the National Health Service Act is "almost a miracle of ineptitude" and that he had read the Act "with a bewilderment which finally ripened into despair", it is not surprising that the practical working of the Act is far from satisfactory. Innumerable examples could be quoted of the confusion arising as a result of the lack of thought shown by the Government in rushing through the Act, but lack of space prevents the mention of more than one or two. For the first nine months of the Service the Government allotted £8,150,000 for the payment of dentists' bills. In actual practice the bill for these nine months has turned out to be £21,800,000. Hospital finance is equally out of hand. Without any prior consultation the Minister has ordered a 10% reduction in hospital costs and this is being imposed in a most arbitrary form. Thus, in the case of St. Bartholomew's Hospital,

this will mean a reduction of £300,000 in the budget, whilst Oxford is suffering a cut of £170,000 on an estimated expenditure for maintenance of £960,000. The effect of this upon an already congested hospital service is obvious and there are already reports coming in of hospitals having to be closed because of lack of money. If hospitals are not to be closed, then their efficiency will suffer.

An excellent example of the fears filling the mind of all interested in the welfare of the sick is a recent letter in *The Times* from Sir Jack Drummond, the eminent authority on nutrition. Writing as chairman of the Hospital Catering and Diet Committee of the King Edward's Hospital Fund, he refers to the deep concern that is felt lest these cuts in hospital expenditure should interfere with the plans for reorganizing the catering services of the hospital which are now under way.

LEPROSY

An exhibition organized by the British Empire Leprosy Relief Association is subserving a most useful function in drawing attention to the intense interest we have in leprosy, in that practically half of the seven million known lepers in the world are British subjects. Although there is no need for alarm, the number of lepers in this country is higher than it has been for several centuries. This is due partly to the return home of infected soldiers and partly to the increasing number of foreigners in the country. The facilities for coping with this problem are ludicrously small, there being only one hospital in the country for lepers—a voluntary hospital with accommodation for 13 patients! After much pressure the Government is at last taking action, and it is hoped that before long leprosy will be made notifiable in this country, and that a hospital will be provided under the National Health Service for the efficient care and investigation of lepers.

TELEVISION AT GUY'S HOSPITAL

Much interest has been evinced in the installation at Guy's Hospital of a television installation for the demonstration of operative technique. This is the first installation of its kind in this country, and expert opinion is enthusiastic about its potentialities. Apparently many of the original difficulties encountered in using television for this purpose have been overcome. According to one report, "seen from a distance of some 15 feet at the back of a lecture-theatre . . . an astonishingly detailed picture" was obtained. WILLIAM A. R. THOMSON

June, 1949.

ABSTRACTS FROM CURRENT LITERATURE

Medicine

Electrocardiographic Changes in Acute Gonococcal Arthritis and Myocarditis Simulating Acute Rheumatic Polyarthritis. Shapiro, E., Lipkis, M. L., Kahn, J. and Heid, J. B.: *Am. J. M. Sc.*, **217:** 300, 1949.

One of the points of importance in the diagnosis of rheumatic fever has been the occurrence of certain electrocardiographic changes considered to be specific for that disease. For some time articles have been appearing suggesting that this apparent specificity is not entirely reliable and pointing out that the changes might occur in other conditions, notably in gonorrhœal arthritis and in certain other diseases. These authors present four cases of acute gonorrhœal polyarthritis in whom there were the electrocardiographic changes usually considered to indicate rheumatic cardiac disease. The cases were diagnosed as gonorrhœal arthritis on the history of recent urethral infection, on the development of septic degenerative x-ray changes in the joint, on the failure of response to salicylates in adequate dosage and on the speedy arrest of the arthritis and the disappearance of fever following giving either sulfonamide or penicillin; supplementary to these were positive complement fixation tests or in some the finding of positive cervical or urethral smears. It is the opinion of the authors that the E.C.G. findings are due to a toxic disease in a toxic myocarditis.

G. A. COPPING

The Two Types of Epithelium of the Finest Bronchioles of the Albino Mouse as Revealed by Supravital Silverization. Macklin, C. C.: *Canad. J. Res.*, Sect. D, **27:** 50, 1949.

Surfaces of bronchiolar epithelium following momentary intratracheal injection of ammoniacal silver solution followed by 10% formalin show as a mosaic of dark and light cells. The light cells occupy more area and indent the others. They have villus-like ends scattered silver grains. The dark cells show rudimentary cilia springing from double uniform golden brown granules set in the cuticle. The bases and sides are demarcated by black grains. Near the respiratory bronchioles they are fewer, shorter and of pyramidal form. The same two types of epithelial cells were found in hamster, and by more common histological methods in man, cat, rabbit, monkey, guinea pig, goat, dog, baboon and rat.

C. C. MACKLIN

What is Psychotherapy to the Internist? Thomas, H. M.: *J. Am. M. Ass.*, **138:** 878, 1948.

Psychotherapy is the treatment of the patient through his mind. The author has attempted to describe the current technique used by psychiatrists. His purpose has been to justify psychotherapy as an integral part of every contact with patients and to indicate each physician's obligation to participate. He believes that the psychologic aspects of treatment of the patient should always be present in the physician's mind and that we must not allow our approach to the patient's psyche to remain amateurish, but by reading and thinking about it we must develop a superior type of psychotherapy which has its foundation on sound internal medicine.

A simple method most medical practitioners find themselves using is a combination of suggestion and reasoning which is reinforced by their prestige and positive assertion. If the patient is to be helped he must be convinced by adequate explanation of the anatomic, physiologic and mental aspects of his case even though the explanation is tedious, time consuming and, often, difficult. It is improper to threaten the patient with dire results unless he obeys instructions, since this method is motivated by fear rather than reassurance.

Reassurance must be based on truth, since a structure built of falsehoods breaks down sooner or later. We should be careful not to force on an unwilling patient disagreeable or alarming statements which we think are true. Gentle probing into the patient's attitude and wishes will reveal the correct course to pursue in his particular case and how much definite information he needs and really desires. Hope need never be completely destroyed even though false hope should be removed lest patients with irreversible lesions continue a futile quest for unattainable cure.

It is impossible to overemphasize the value of hope to the patient. Hopefulness developed through a true understanding of the symptoms can be translated into a desire for and an effort toward improvement. Solomon knew the importance of this when he said in the Book of Proverbs, "Hope deferred maketh the heart sick; but when the desire cometh, it is a tree of life".

An ill timed effort at humour may infuriate or wound the patient, yet the physician's sense of humour is a magnificent therapeutic instrument. Unfortunately, psychiatric instruction gives us little or no help in its use. If the doctor can find a neutral object about which he and the patient can laugh, then the tension is lessened and a sense of friendliness and common purpose estab-

lished. The introduction of humour must not conflict with the serious and thorough consideration of the patient's complaints. We may not be too casual on the one hand or too much concerned on the other. The only sure way of reaching the proper attitude is to understand the patient's thoughts and anxiety reactions and to watch very closely the nature of his responses with a sensitive appreciation of what persons usually worry about in the particular situation. J. PRESTON ROBB

Anion Exchange Resins in the Treatment of Heartburn During Pregnancy. Kasdon, S. C.: *New England J. Med.*, **239:** 575, 1948.

Heartburn occurs in approximately two-thirds of pregnant women and is generally considered to be a neuromuscular dysfunction of the œsophagus and stomach, allowing regurgitation of stomach contents back into the lower œsophagus. This theory of causation has been strongly supported by the excellent therapeutic results obtained with prostigmine. The author obtained complete relief in all but four of 35 pregnant women with heartburn through the use of anion exchange resins. This unexpected result with an admittedly irrational and unphysiologic agent suggests that the modern theory of the etiology of heartburn in pregnancy is open to question. NORMAN S. SKINNER

The Treatment of Ruptured Liver with Absorbable Hæmostatics. Papen, G. W. and Mikal, S.: *New England J. Med.*, **239:** 920, 1948.

Hæmorrhage from large or ragged lacerations of the liver are best treated by packing with absorbable hæmostatic sponges (gelfoam, oxycel, fibrin foam or fibrinogen foam). These packs may be held in place by simple pressure, by suture to the liver capsule or to the diaphragm and abdominal wall. Closure of the abdomen without drainage is advised to lessen the chance of infection. Details of three cases successfully treated by the above method are presented. In one case in which drainage was employed a temporary biliary fistula and subhepatic abscess necessitated thoracotomy and rib resection. NORMAN S. SKINNER

Surgery

Venous Obstruction in the Upper Extremity. Hughes, E. S. R.: *Brit. J. Surg.*, **36:** 155, 1948.

The diagnosis of venous obstruction of the arm in a previously and otherwise healthy person is generally obvious. There is usually not much pain. The prognosis is excellent, but it may recur, and may prevent the patient from continuing his former occupation and residual after-effects often persist. Of the many explanations offered for the obstruction, all depend on the formation of a thrombus in the axillary or subclavian vein. But operation fails to show a thrombus in many cases, though intravascular clotting may complicate secondarily. Research is described which indicates that a phrenic nerve anterior to the subclavian vein may constrict it against the tendon of the scalenus anterior tendon. Anticoagulants should be administered early to limit intravascular clotting. Paravertebral sympathetic block may shorten the convalescence. BURNS PLEWES

Surgical Treatment of Non-specific Ulcerative Colitis. Fansler, W. A. and Frykman, H. M.: *Am. J. Surg.*, **76:** 713, 1948.

The most useful surgical procedures for ulcerative colitis are (1) ileostomy; (2) ileostomy with complete colectomy; (3) colectomy with ileoproctostomy; (4) vagotomy. The indications for and results of the first three are fairly well known. Surgery is indicated only when other measures have failed.

Transthoracic vagotomy has resulted in improvement in a group of 4 patients, but less than a year has elapsed since the first case was operated upon. But striking improvement was seen in the acute fulminating stage of the disease, and it seems most likely to be indicated in the acute or early chronic stage of ulcerative colitis. In intractable cases with the colon converted into a thick fibrotic tube, especially if there is polyp formation and, therefore, a real danger of carcinoma, intestinal surgery of some kind is the procedure to be preferred. BURNS PLEWES

Radical Mastectomy. Riddell, V.: *Brit. J. Surg.*, **36:** 113, 1948.

No other method of treatment of early carcinoma of the breast has produced as satisfactory results as radical mastectomy. In 11,014 radical mastectomies by 22 British surgeons in 20 years the mortality was 1.65%, and the operative mortality was falling during this period. In 170 consecutive cases no patient died within one month of operation or while still in hospital. This is a sign of the times rather than an exceptional experience, for with modern anæsthesia, sulfonamides and penicillin, the operation probably has a mortality of less than 1%. It is probable that the deaths that do still occur are in cases which are unsuitable for or unprepared for the operation. Shock and sepsis, and pulmonary complications should now be eliminated as serious postoperative complications. Since the operation has remained essentially the same for 50 years perhaps it has become too frequently regarded as within the compass of the occasional surgeon.

The technique of the operation is carefully described: indications for preoperative transfusions, preoperative radiography for metastases, measures against shock, preoperative cleansing, maintaining the blood supply to the lateral flap, proper draping of the patient, limitations of diathermy, methods of drainage, delaying arm movement until the wound is healed, avoiding wet sponges, etc. The pectoral muscles must be removed; it is the removal of the breast which is mutilating and a thorough operation should be done if any tissue is removed. Delay in wound healing is important if it delays necessary postoperative irradiation. BURNS PLEWES

Obstetrics and Gynæcology

Calcium and Phosphorus Metabolism in Pregnancy: A Survey under War and Post-war Conditions. Obermer, E.: *J. Obst. & Gyn. Brit. Emp.*, **55:** 791, 1948.

Brief postnatal data are given for 39 out of the 53 women who took part in this survey, divided into 7 groups—1 control and 6 given supplements of calcium and phosphate and/or calciferol. The weight charts of 38 infants, divided into the same groups, are discussed. No correlation could be found between the average 48-hour loss or gain of calcium and phosphorus of the mother during pregnancy and the increase in weight, as shown on the individual infant's weight chart. No correlation could be found between the maternal findings during pregnancy and the mean group weights of the infants at 6 months and 1 year. The mean weight increases for Group C—the group in which there was the least maternal loss of calcium and the maximum retention of phosphorus during pregnancy—were greater than all other groups from the 13th to 16th week and from the 27th to 52nd week, and the second highest from birth to 12th week. P. J. KEARNS

Etiology of Eclampsia. Beker, J. C.: *J. Obst. & Gyn. Brit. Emp.*, **55:** 756, 1948.

The etiology of eclampsia is to be sought in a disturbance of hæmodynamic equilibrium in the general circulation. Normal pregnancy and labour cause a slight vasoconstriction in the periphery and an increased minute/output of the heart. At all times the nutrition-reflex of the pregnant uterus will urgently require a sufficient blood-supply to the intervillous spaces to guarantee the

life of the fetus. The reflex is most probably hormonal. Two forms of the disease should be recognized. The one is due to an abnormal resistance offered to the circulation of blood within the uterine wall, and the other is the result of a deficient adaptation of the general circulation to the requirements of the uterus in pregnancy and delivery. All clinical observations may be explained by circulatory deficiency in spite of a maximal attempt to respond to the nutrition-reflex of the pregnant uterus. The strongest arguments against "toxæmia" are cases of intercurrent eclampsia and the exacerbation of clinical symptoms during labour long after the death of the fetus.

P. J. KEARNS

Rhesus Factor Iso-immunization and Hæmolytic Disease of the Newborn. Philpott, N. W.: *J. Obst. & Gyn. Brit. Emp.*, **55**: 774, 1948.

When there is a history of repeated tragedies and the wife is rhesus factor negative with the husband rhesus factor homozygous positive, means should be afforded to prevent subsequent pregnancies. In addition, the general assessment of this problem makes one pause to consider the advisability of trying to save the pronounced case of hæmolytic disease in the newborn. Under proper supervision mild cases progress favourably, but in those cases who have severe manifestations and who survive there is a moderately high incidence of physical and mental defects.

Importance of iso-immunization does not lie in its frequency but rather in the seriousness of subsequent manifestations. Antenatal antibody studies aid in making a prognosis. Premature delivery may be indicated by variations in titration levels. The liberal use of rhesus negative blood, if indicated, frequently prevents immediate or remote complications in the infant. Fetal liver damage plays an important rôle in the progress of the disease. The use of methionine has been used as a liver protective with apparent good results.

P. J. KEARNS

Hæmolytic Disease of the Newborn: Criteria of Severity. Mollison, P. L. and Cutbush, M.: *Brit. M. J.*, **1**: 123, 1949.

The hæmoglobin value of the cord blood of an infant with hæmolytic disease is well correlated with the severity of the disease. Infants whose cord blood contains less than 8 gm. % are very likely to die within 24 hours of birth. These infants often show a raised venous pressure and probably die from cardiac failure. Infants with values over 14.5 gm. % are very likely to recover without treatment. Deaths from kernicterus at two to five days occur in some of those infants who are anæmic at birth but not so anæmic as to die within 24 hours. Hæmoglobin values of blood samples taken after birth are much more difficult to interpret because of (*a*) the placental transfer of blood, and (*b*) the large capillary/venous differences in the newborn. The cord plasma bilirubin taken alone is a less valuable index of severity than the cord hæmoglobin. However, taken in conjunction with the cord hæmoglobin it is of definite value in assessing the severity.

In this series erythroblastæmia was present on the first day of life in all moderately severe cases and was a striking feature in all the fatal cases; in mild cases the number of nucleated red cells was usually within normal limits. The strength of the direct Coombs test and the amount of free Rh antibody titre shows some correlation with the severity of the hæmolytic process in the infant. In practice exceptions are frequent and antibody tests can be used only to forecast probabilities. These findings emphasize the importance of determining the hæmoglobin and bilirubin values of cord blood as a means of grading cases of hæmolytic disease of the newborn. Not only is this of help in deciding whether treatment is needed, but it should make it possible to compare one treated series with another and to decide whether equal numbers of severe cases have been included.

ROSS MITCHELL

The Prophylactic Use of Penicillin in Obstetrics. Tupper, W. R. G. and Davis, M. M.: *Am. J. Obst. & Gyn.*, **57**: 569, 1949.

Prophylactic penicillin intramuscularly was given 446 patients every three hours for ten doses beginning immediately postpartum, with a morbidity rate due to genital tract infection of 2.2% using the "standard morbidity" and 37.6% using the low standard selected (99.2° F. for more than 12 hours). In the control group of 457 cases, the morbidity rate was 7.4% using the standard morbidity and 54.9% using the low standard.

The effect of prophylactic penicillin associated with both early and late risers was compared with the nonprophylactic-penicillin group, using both the "standard morbidity" and the low standard of 99.2° F. An appreciable improvement in percentage morbidity was noted during use of prophylactic penicillin on both early and late risers. The seasonal variation of morbidity for both groups using both standards of morbidity was noted. In general it shows no regular variation. The monthly improvement of morbidity under prophylactic penicillin is noted. The relation of operative procedures to morbidity was noted and the effect of prophylactic penicillin in reducing this morbidity studied. The percentage morbidity during operative procedures was definitely less with the use of prophylactic penicillin. A study of the incidence and percentage of the causes of morbidity was made, and the effect of prophylactic penicillin in reducing the incidence of these various diseases. The improvement was noted chiefly in those cases associated with genital tract infection. Fewer patients developing a temperature of 99.2° F. went on to higher temperatures. Average hospital days per patient of both groups were compared.

ROSS MITCHELL

Neurology and Psychiatry

Transient Cerebral Paralysis in Hypertension and in Cerebral Embolism. Pickering, G. W.: *J. Am. M. Ass.*, **137**: 423, 1948.

A variety of cerebral attacks occur in hypertension. In cerebral hæmorrhage consciousness is lost suddenly and is not usually regained before death ensues; when recovery does occur a permanent disability often remains. In thrombosis of a cerebral artery with massive infarction of the brain, consciousness is also suddenly lost, and when it is regained, a hemiplegia, a hemianopsia or other lesion usually remains. There are also other attacks in which the disturbances are of a much shorter duration. In hypertension of recent origin such as acute nephritis or pregnancy "toxæmia", or in a chronic hypertension with recent exacerbation, attacks occur in which severe headache is followed by vomiting, drowsiness, bradycardia, convulsions and coma. These attacks may be preceded or followed by focal symptoms and signs, and clear up without residual nervous phenomina. The headache, vomiting, etc., have been considered to be due to acute œdema of the brain.

The author endeavours to prove that in chronic hypertension attacks of localized motor or sensory paralysis of brief duration are probably not due to cerebral arterial spasm but to sudden organic arterial occlusion, for example by a thrombosis. The speed and completeness of recovery from paralysis will depend on the size of the final infarct and on its position; the resolution being due to the restoration of circulation through collateral vessels. He points out that the cerebral arteries have a comparatively poorly developed muscular walls and they constrict poorly to known vasoconstrictor agents. In the cases studied there was no sharp dividing line between the cases that showed a rapid recovery and those in whom the defects persisted. Also in other patients attacks occurring as a result of embolic phenomena could not be distinguished from those occurring in hypertension.

J. PRESTON ROBB

The Use of Malononitrile in the Treatment of Mental Illness. MacKinnon, I. H., Hoch, P. H., Cammer, L. and Waelsch, H. B.: *Am. J. Psychiat.*, **105:** 686, 1949.

The Effect of Glutamic Acid upon the Mental and Physical Growth of Mongols. Zimmerman, F. T., Burgemeister, B. B. and Putnam, T. J.: *Am. J. Psychiat.*, **105:** 661, 1949.

These two papers are mentioned together because they bear on the perennial hope of practically wiping out mental disease by biochemical magic. The first one represents a trial of a drug which has received attention because of reports from the Caroline Institute in Stockholm, of a decrease in the nucleoprotein content of nerve cells from the brains of psychotic patients, and of the effect of the drug, malononitrile, experimentally to increase cellular nucleoprotein content in the nervous system. This paper, from the New York Psychiatric Institute, indicates no detectable therapeutic effect of the drug in a group of six schizophrenic and two manic-depressive patients.

The second paper from the New York Neurological Institute, is encouraging, however, concerning practical progress which has been made in the chemotherapeutic approach. Glutamic acid has already been shown to raise the intelligence level of mentally retarded children. In this paper there are reported the results of glutamic acid on Mongolian idiots in comparison with control cases of nonmongoloid mental retardation. The Mongolian idiots showed a statistically doubtful increase in intelligence level, compared with a significant increase in the nonmongoloids. Furthermore the Mongolian idiots showed an unexpected increased gain in height and weight indicating a more generalized effect of glutamic acid than the authors had "dreamt of in their philosophy". The details of administration are available in previous papers by the same authors included in the reference list. The dosage is 24 to 36 gm. a day, the level being set, after gradually increasing doses, according to an optimum increase in motor activity and reflexes, short of distractibility or aimless physical activity.

W. DONALD ROSS

Psychology

Emotional Factors in the Etiology of Hyperthyroidism. Lidz, T.: *Psychoso. Med.*, **11:** 2, 1949.

The author presents a concise summary of the literature on the emotional aspects of hyperthyroidism followed by abstracts from the case histories of fifteen patients which illustrate his own findings in agreement with some of the previous major contributions to the subject. The conclusions should be of interest to internists, general physicians, and thyroid surgeons. Emotional factors are considered to be of considerable importance in etiology, although with full recognition that they operate along with other multiple factors in the metabolic equilibrium of the individual. The types of emotional traumata, and the personality characteristics of the individuals, seemed to be fairly constant in the author's patients at Johns Hopkins and in those of two other careful investigations. There were some variations depending on whether the patients were female (the majority) or male, and on whether the women were married and over 45, married and under 35 years of age, or unmarried. However, as a group, they tended to have been the successful rivals with siblings for parental affections after originally having felt rejected. They identified with their mothers and took on her oversolicitous attitude, to become over-anxious to give to others, for fear that they would not otherwise be loved. They dominated their own children, expecting excessive fidelity from them, and hiding from themselves the extent to which they were dependent on others, including their own children. The onset of the hyperthyroidism often occurs following the loss of, or the breach of a relationship with, someone on whom they had attached such a dominating dependency, usually a child or a sibling, sometimes a husband, lover, or parent. Although the author does not mention it, there are similarities to the emotional traumata associated with ulcerative colitis, but there are differences even at the psychological level, quite apart from the physiological factors which presumably differ in the two conditions.

W. DONALD ROSS

Pathology

Boeck's Disease (Boeck's Sarcoid). Rosenthal, J. and Feigin, I.: *Arch. Path.*, **45:** 681, 1948.

In this article the autopsy findings in four cases are presented after a brief review of current opinion regarding causation and pathogenesis. The authors state that the lesions of Boeck's disease can be differentiated from other granulomas on morphological grounds alone, not only in the acute stage, but also, in many cases, in the chronic or healing stages. Active lesions are characterized by conglomerate masses of epithelioid cells forming discrete tubercle-like nodules with a variable number of multinucleated giant cells. Lymphocytes are scanty or absent. There is no evidence of caseation and tubercle bacilli cannot be found.

The authors find that the two chief modes of healing are fibrosis and hyalinization, the two frequently proceeding side by side. With the former, scars are produced which may defy differentiation from the end results of other granulomatous processes. However, they state that healing by hyalinization is a frequent occurrence and they consider it to be characteristic of Boeck's disease. This appears to consist of a direct hyaline replacement of epithelioid cell cytoplasm without necrosis. The end result is an acellular hyaline scar. So, in chronic cases, differentiation from other granulomas is based upon the finding of a marked tendency toward hyalinization within the tubercles, without necrosis or calcification, with a variable amount of fibrosis, and often with the retention of occasional outlines of tubercles within hyalinized areas.

J. W. BAWDEN

Testicular Tumours. Scully, R. E. and Parham, A. R.: *Arch. Path.*, **45:** 581, 1948; **46:** 229, 1948.

The authors briefly review the literature regarding the nature and classification of testicular tumours and propose the following classification, based solely on histological criteria: (1) seminoma; (2) teratoma, (*a*) histologically malignant, (*b*) histologically benign; (3) interstitial cell tumours; (4) miscellaneous group.

Each type of tumour is then discussed with particular reference to cases studied personally.

Seminoma: (embryonal carcinoma of Ewing, embryonal carcinoma with lymphoid stroma of Ewing, spermatocytoma, dysgerminoma). The authors studied 17 cases varying in age from 27 to 75 years. The series included 8 cases of intrascrotal tumour in which orchidectomy, with or without prophylactic roentgen therapy, resulted in cure (periods of observation 1 to 20 years), 5 cases of intrascrotal tumour which presented metastases at the time of admission, or shortly thereafter, and all of whom died, and 2 cases of intra-abdominal tumour, one of whom survived for 18 years following the removal of the tumour and roentgen therapy in spite of the probable presence of metastases in the liver and lung. None of the cases had shown a positive Aschheim-Zondek test.

Histologically malignant teratoma: (teratocarcinoma, embryonal carcinoma of Friedman and Moore, embryonal adenocarcinoma, adenocarcinoma). The study included 16 cases varying in age from 17 to 48 years. Eleven cases showed syncytiotrophoblastic elements in the tumour, 5 areas of seminoma, 2 fibrosarcoma, 2 mesonephroma and 1 neuroepithelioma. The authors regard embryonal adenocarcinoma as a variant of teratoma owing to the fact that a sufficient number of sections always reveals teratomatous elements and that the connective tissue stroma usually reveals teratoid potentialities. The Aschheim-Zondek test was positive in 5 of 8 cases. Of 13 patients 10 died of metastases, 3 were living 9 months, 2 years and 20 years after operation.

Histologically benign teratoma: (adult teratoma). No cases were encountered in the present series. The authors distinguish three types of tumours. The organized teratoma shows the formation of rudimentary organs and resembles a malformed fetus, the unorganized teratoma shows a disorderly arrangement of bi- or tri-dermal structures and the simplified teratoma, a monodermal variety, which includes epidermoid and dermoid cysts. The authors believe, with Friedman and Moore, that the metastases of this type of tumour are due to the dissemination of an undifferentiated cell, the mother cell of both types of teratoma.

In the second part of the study the authors review the literature regarding interstitial cell tumours, adrenal cortex nest tumours, multicystic adenocarcinomas and adenocarcinoma of the rete testis, and present one case of each. Other tumours, including arrhenoblastoma, lymphosarcoma, metastatic tumours and tubular "adenomas" are briefly discussed. The authors do not regard the latter as true neoplasms owing to its frequent occurrence in undescended testes and the absence of malignant tendencies. F. A. JAFFÉ

Intracranial Lesions in Late Rheumatic Heart Disease. Denst, J. and Neubuerger, K. T.: *Arch. Path.*, **46:** 191, 1948.

The authors examined sections of the brain of 14 cases of chronic rheumatic heart disease in patients over 25 years of age. In 9 of these cases they found lesions of arteries. The larger and smaller arteries and veins, mainly in the leptomeninges, showed a variety of lesions including thrombosis, endarteritic proliferation, alteration of the elastic membranes and fibrosis of the media and adventitia. They regarded the histological picture, "as a rule . . . sufficiently characteristic to permit differentiation from other vascular lesions that occur in the same location". Since by their own admission, the authors did not regard these lesions as identical with the typical inflammatory picture of generalized rheumatic arteritis, but only similar to inflammatory lesions of arteries seen in a variety of conditions, including rheumatic fever, it is difficult to accede to the possibility that they may be differentiated from other vascular lesions occurring in the brain. Further, examination of the photographs does not permit one to be any more confident that the lesions are more than can be accounted for by non-specific thrombosis or embolism occurring in a patient with chronic myocardial insufficiency. Nevertheless, it is of interest that vascular lesions occur so frequently in the brains of these patients and that they may give rise to focal neurological signs. The use of the term "rheumatic brain disease" is justified by the authors, but this does not appear to be established as an entity by the evidence presented. SIDNEY D. KOBERNICK

Visceral Lesions in a Case of Rheumatoid Arthritis. Gruenwald, P.: *Arch. Path.*, **46:** 59, 1948.

This is the report of a case of typical rheumatoid arthritis of six years' duration in a 57 year old man, who was completely incapacitated prior to his death. At autopsy typical joint lesions of rheumatoid arthritis were found. In addition lesions designated as "granulomas of rheumatoid arthritis" were seen in the right atrium, tricuspid valve, pleura and capsule of the spleen. The latter varied from lesions with necrotic centres surrounded by a zone of radially arranged spindle cells, and in turn by a zone of lymphocytes and granulation tissue, to completely fibrotic nodules made up of dense, whorled bands of collagenous and argyrophil fibres. Langerhans type and non-specific giant cells were seen in many of the more acute lesions. Organisms were not demonstrated in the sections.

The author correctly points out that there is no direct proof that the lesions are those of rheumatoid arthritis but the relationship is suggested by the fact that they occurred in a patient suffering from the disease, that the granulomas resembled those of the subcutaneous tissue in structure, and that there were no bacteria demonstrable in the tissue sections. SIDNEY D. KOBERNICK

Industrial Medicine

Prognosis in Pulmonary Tuberculosis. A Ten-year Follow-up Study. Allison, C. R.: *Occup. Med.*, **5:** 379, 1948.

That the great majority of persons with roentgenographic evidence of minimal pulmonary tuberculosis can be safe, dependable employees, has been confirmed. It should be recognized that roentgenographic evidence of tuberculosis is no bar to employment, that active infection discovered in the minimal stage is arrested with relative rapidity and that the patient may return to work. The author of this article reports the experience of the Eastman Kodak Co. of Rochester, N.Y., where a program for control of tuberculosis based solely on an initial history, medical examination and periodic films of the chest, has been in operation for 25 years. The observations presented are those made on the course of the disease in a group of employees with clinical and/or roentgenographic evidence of pulmonary tuberculosis who were followed for ten or more years.

During the ten-year period, January, 1938 to January, 1948, 2,348 persons—including 1,820 men—were continuously employed. Of this number, 93 had roentgenographic signs indicating minimal or moderately advanced pulmonary tuberculosis, either when employed or when the first roentgenogram was made. All had periodic roentgenograms of the chest over at least ten years, every six months to three years, depending upon the relative "hardness" of the lesion. Eighty-five of the group showed no clinical evidence of active infection. They were persons working at a wide variety of jobs, some of which involved heavy manual labour and long hours, particularly during the war years. Their records show that at no time did any person in the group have suggestive symptoms referable to his chest. They lost little time on account of illness. Tables and charts present the findings in the cases where active pulmonary tuberculosis developed. Roentgenograms show the changes which took place in the lesions. It was noted that active pulmonary tuberculosis occurred in persons after many years of apparent inactivity, after the age of 35 in the majority and after a roentgenogram of the chest negative for the disease at 45 years of age.

Such a long term follow-up study of a group of workers with roentgenographic evidence of minimal pulmonary tuberculosis indicates that in the vast majority of persons beyond early adulthood, the trend is toward resolution, fibrosis and calcification. The author refers to another study recently reported where the observations were similar. MARGARET H. WILTON

Sickness Among Industrial Employees in Baltimore in Relation to Weekly Hours of Work, 1941 - 1943. Collins, S. D.: *Milbank Mem. Fund Quart.*, **26:** 398, 1948.

That long hours of work have a direct bearing on health and efficiency of workers has been recognized for many years. Investigations of this problem, begun in England during the first World War, were greatly stimulated in both England and the United States during the years of the second World War. Many of the published studies however, deal with the subject from an economic point of view; relatively few show data on time lost on account of sickness and injury in relation to hours of work. In this article the author presents the findings of a study conducted recently by the U.S. Public Health Service and the Milbank Memorial Fund among families in the Eastern Health District of Baltimore, Maryland. The data were obtained by monthly visits to the family. The general morbidity study lasted 5 years; for 2½ years of that time special data were collected by the can-

vassers, which permitted a comparison of sickness rates among persons working different hours per week. The employed persons were classified as to weekly hours of work as follows: long, 50 or more hours; medium, 44 to 49 hours; and short, 24 to 43 hours. Unemployed persons and those working less than 24 hours per week were not included in the study. The illnesses and injuries were tabulated by such types as disabling, confined to bed, and attended by a doctor, and for several broad diagnoses.

After discussing some of the economic and environmental factors which were present during the period, the author gives a detailed presentation of the survey findings. Eight tables and nine figures are included. Nearly all of the data are shown separately for male and female workers. Analysis of the findings shows sickness rates that rather consistently increase from a low incidence in the short-hour group to rather high rates in the long-hour group.

In connection with doctors' calls it was seen that doctors' calls per 1,000 workers were larger in the long-hour group (on the other hand, doctors' calls per attended case were higher in the short-hour group). Minor respiratory rates were higher among long-hour workers than among those working short hours; the same was true of accident rates. Reference is made to causes of absence, other than illness. It was noted that loss of time without advance approval was less in the short-hour group. The author briefly discusses also the possible effects of certain other factors as: income of worker and his family, occupational class and type of work, but he does not consider them sufficient to account for the differences found in illness rates in the several hours-of-work groups.

MARGARET H. WILTON

OBITUARIES

Dr. Fred. F. Tisdall

AN APPRECIATION

It is with great sorrow that we record the recent death of Dr. Frederick F. Tisdall, O.B.E., M.D., F.R.C.P.[C.], F.R.C.P.(Lond.). In his death the Hospital for Sick Children, the University of Toronto and the medical profession at large have lost an excellent teacher, organizer and demonstrator as well as a brilliant research worker At the time of his death Dr. Tisdall was Associate Professor of Pædiatrics, University of Toronto, and Physician to the Hospital for Sick Children, also Director of Research Laboratories, Department of Pædiatrics and Hospital for Sick Children.

During the war he was Consultant on Nutrition to the Royal Canadian Air Force with the rank of Group Captain. He was a member of the Canadian Council on Nutrition; Chairman, Committee on Nutrition of the Canadian Medical Association; Chairman, National Nutrition Committee, Canadian Red Cross Society; Member of the Food and Nutrition Board, National Research Council, Washington; and for some years was a Member of the Standing Advisory Committee on Nutrition of the Food and Agriculture Organization of the United Nations. He was the author of the book "The Home Care of the Infant and Child", and co-author with Alan Brown of the textbook "Common Procedures in the Practice of Pædiatrics". In addition to this he published over one hundred and twenty-five scientific articles, most of which had to do with the subject of nutrition. His high scientific attainments were coupled with endearing personal qualities which made him welcome everywhere he went, and in every circle in which he mingled.

Within a relatively short period, Dr. Tisdall won an international reputation for his research in human nutrition. Almost everything he did was related to the needs of people and the times. Some of his findings brought immediate benefits to many and all his work will be of lasting benefit, not alone to Canadians, but to the whole of mankind. He helped to improve the food standards for families on relief; he originated the prisoner-of-war parcels sent overseas by the Canadian Red Cross committee; he raised the dietary standards of the R.C.A.F. The surveys Dr. Tisdall conducted among Canadian Indians and in Newfoundland will doubtless lead to many improvements in the health of these groups.

As a man he was widely loved. Generous, loyal, humorous, and deeply interested in people, he was the centre of a large circle of friends. He was fond of the children whose interests he served for so long, and took a keen personal interest in individual cases. He will be greatly missed by his colleagues and the nation has lost much by his passing. His pride and joy was the seventy acre farm he purchased and made his home since 1937. In his spare time he assisted his hired help in the chores about the farm, one of the oldest in York county. In addition to this hobby he was keenly interested in fishing and shooting.

ALAN BROWN, M.D.
T. G. H. DRAKE, M.B.
J. H. EBBS, M.D.

Dr. Albert E. Archer died on May 23 in the hospital he founded 40 years ago at Lamont, Alta. He was 70. Dr. Archer had been mentioned as a possible successor to J. C. Bowen, Lieutenant-Governor of Alberta, but he indicated recently that because of failing health he would not be able to accept the appointment. He was born at Campbellford, Ont. He took a course in teacher training and taught school for one year near Port Dalhousie. He graduated in medicine from the University of Toronto, in 1902 and joined the staff of the Hamilton City Hospital. Dr. Archer came to Alberta in 1903, settling in the village of Star in the Lamont area. He became a fellow of the American College of Surgeons in 1921 and of the Royal College of Surgeons of Canada in 1931. In 1942 he was made a commander of the Order of the British Empire. He is survived by his widow; two daughters, two sons, a brother and a sister. Fuller notice will appear later.

Dr. Daniel Baldwin, aged 76, died on May 17 at Benito, Manitoba, where he had practised since his graduation from Manitoba Medical College in 1907. Before entering medicine he taught school at Cypress River, Man. He is survived by his widow, two sons and a brother.

Dr. William Alvin Cooper of Winnipeg, died at Grace Hospital May 6 after a short illness. Born at Boissevain in 1883, he moved with his family to Winnipeg in 1900. After teaching for two years in the Beausejour district he entered Manitoba Medical College from which he graduated with honours in 1909. From the time of graduation he practised in Winnipeg. Active in the cause of temperance he served as grand councillor of the Manitoba Royal Templars, and was an elder of Young United Church. He is survived by his widow, two daughters, one of whom is supervisor of the maternity department of the Winnipeg General Hospital, and three sons, and six grandchildren.

Dr. Hugh Alexander Cuthbertson died in Chicago on April 21. He graduated in medicine from the University of Toronto in 1894.

Dr. Félix d'Hérelle est mort récemment en France. Il était né à Montréal en 1873.

Dr. Manly Finklestein of Winnipeg died on May 14 at Montreal, aged 50. Born and educated in Winnipeg, he graduated from Manitoba Medical College in 1920, winning the Hudson's Bay Fellowship. He was bacteriologist for the City of Winnipeg and later entered into practice for himself. After postgraduate work in 1942

at New York in the treatment of allergy, he became a member of the Mall Medical Group. He was a member of the Masonic order and of the B'nai Brith. He is survived by his widow, a son and a daughter.

Dr. Alexander V. Forrester, aged 52, staff physician at Highland Park General Hospital, Detroit, died on May 10. He was born in Victoria, B.C. After completing his first year in medicine at McGill University, he enlisted in the army during the Great War and went overseas with the No. 1 Field Ambulance. He resumed his studies at McGill upon discharge. As an American citizen, Dr. Forrester practised exclusively in the United States and was associated with the U.S. Army during the World War. He is survived by his mother, a sister and three brothers.

Dr. John Cyril Hewgill died in Kenmore, Ohio, on November 8, 1948. He graduated in medicine from the University of Toronto in 1922.

Dr. James Johnston died of arteriosclerosis in Los Angeles on October 27, 1948. He graduated in medicine from Trinity in 1884.

Dr. C. M. Kelly died at his home in Saint John, May 29, after a rather long illness. He was in his 73rd year. Born in Kings County, Dr. Kelly received his B.A. from University of New Brunswick. For some time he taught school in Hampton and Kingston. In 1909 he received his M.D.C.M. from McGill and after internship in Saint John began practice in Tracadie, N.B. From 1911 till the time of his recent illness he practised in Saint John, holding senior staff appointments in the St. John General and St. Joseph's Hospitals. At the time of his death he was a Surgical Consultant at the General and Chief of the Surgical Service at the St. Joseph's. For many years Dr. Kelly was Radiologist at St. Joseph's Hospital and his opinion on x-ray diagnosis was always sound. It was as a surgeon that Dr. Kelly was best known and here his mechanical gift was an aid to his constantly refreshed knowledge of his specialty, year after year he spent his holiday periods attending surgical clinics in the Eastern United States. As a devout Catholic Dr. Kelly was a life member of the Knights of Columbus and active in the parish of the Cathedral. His hobbies included languages—French, Italian, German and Spanish,—reading, his family and hard work. He was a sterling friend and a doughty adversary. The doctor is survived by his widow and two sons Dr. F. Paul Kelly and John C. Kelly.

Dr. James Harold King died at St. Joseph's Hospital, Guelph, Ont., on May 11, after an illness of 4 months. Although born in Eastern Ontario Dr. King had lived from his infancy in the town of Dresden up to the time of taking up his college career. He obtained his degree of M.D. from the University of Western Ontario in 1897 and later attended Trinity University in Toronto. In politics he was prominent as a Liberal. In a by-election in 1934, following the passing of the sitting member, the late Paul Munro, he was elected to succeed him in the Ontario legislature, defeating Beverley Robson and was re-elected in the ensuing provincial election of 1937, winning over George Drew the Conservative candidate. Dr. King retired from active politics in 1942. In his younger days he was known as a most proficient cornetist and for a time conducted the Dresden town band. Angling was another of his hobbies. He was a member of the Masonic Lodge at Dresden. He is survived by his widow, three daughters and two sisters.

Dr. Nicholas Kovaleff, aged 60, died in Vancouver on May 4. A former White Russian army officer, Dr. Kovaleff graduated from the University of Tomsk in 1913. He joined the White Russian army and fled to China after the revolution, coming to Canada in 1925. Dr. Kovaleff served at Cranbrook Catholic Hospital, and at Procter, near Nelson, before coming to Vancouver. His widow survives.

Dr. Arlof Robert Lindsay, aged 54, died suddenly on May 5, at St. Catharines, Ont. Born in Hagersville, he had been a resident of St. Catharines since 1920. He was a graduate of the University of Toronto in 1916 and was a member of the Ontario Medical Association and of the Royal College of Physicians and Surgeons. He was a certified specialist of the Royal College of Physicians and Surgeons of Canada in pædiatrics and was chief pædiatrician at St. Catharines General Hospital for the past 25 years. Keenly interested in municipal affairs, he was a former member of the St. Catharines board of education and was chairman in 1941-42. He was a member of St. George's Church and former member of the St. Catharines Lions Club. A veteran of the First World War, he served with the Imperial Army medical corps in Mesapotamia and East Africa. He is survived by his widow, two daughters, two brothers and one grandchild.

Dr. Henry H. Loeb, 28-year-old Ottawa pædiatrician, died suddenly at his home on May 15. He had been ill only a short time. A graduate of Lisgar Collegiate, he studied medicine at Toronto University while serving in the Canadian Army Medical Corps. He joined the R.C.A.M.C. in 1941 and was allowed to continue his studies till his graduation in 1944. He was discharged with captain's rank. He was a member of the College of Physicians and Surgeons, Phi Epsilon Medical Fraternity and Ottawa Pædiatric Society. He was a member of Aduth Jeshurun Synagogue and the Young People's League. Besides his widow and parents, he is survived by a daughter and five brothers.

Dr. Wallace McConan died at Smiths Falls on December 10, 1948. He graduated in medicine from Queen's University in 1933.

Dr. Robert George R. McDonald died on April 28, in Sarnia, Ont. He graduated in medicine from the University of Toronto in 1898.

Dr. Edward Foster McIntosh, former physician of Morrisburg, Ont., died of a heart attack at Helen Mines, near Sault Ste. Marie on May 1. He was born at Dundela and graduated in medicine from Queen's University. He interned in Hepburn Hospital at Ogdensburg, and also in a New York City Hospital, and came to Morrisburg to establish a practice in 1930, which he conducted most successfully until the outbreak of war in 1939. Then he enlisted in the Medical Corps. After his discharge, he practised for some time in the Royal Ottawa Sanatorium and later went to Northern Ontario, where he followed his profession. He is survived by his widow, his father, one daughter, one son and one sister.

Dr. Robert Edward Alexander Milne died of cancer in LeRoy, N.Y., on May 4, 1948. He graduated in medicine from the University of Toronto in 1925.

Dr. Chester Nephy Mooney died in Toronto on May 3. He graduated in medicine from the University of Toronto in 1907.

Dr. D. A. Morrison died of a coronary thrombosis on May 20 during a visit to London, Ont., to attend the Annual Meeting of the Ontario Medical Association. He was 58. He was actively interested in crippled children and suffered from arthritis himself for several years. A strong supporter of community welfare, Dr. Morrison was a medical examiner of Canada's armed forces during World War II, and a past potentate of Mocha Temple of the Shrine. Graduating from McGill University in 1914 he served as medical officer of the 3rd Battalion in France during World War I as major, heading a field ambulance group. After his discharge he opened his own office in Brantford. A short time ago he was made a Fellow of the American Academy of Medicine. He was also a member of the Canadian Medical Association, the Ontario Medical Association, and the Academy of

Medicine at Toronto. He was a native of Glengarry County. Besides his widow he is survived by two brothers.

Dr. Charles D. Thomas Mundell, aged 47, former member of the Queen's University football team, died at his home in Montreal on May 19. Born in Kingston, he attended the Kingston public schools and collegiate institute and Trinity College, Port Hope, before entering the Royal Military College. At R.M.C. he won the Governor-General's Sword of Honour and many prizes. After receiving his medical degree and Bachelor of Commerce degree from Queen's University, he was occupied with cancer research at the Kingston General Hospital. He later accepted a position with the duPont Cancer Research Centre in Philadelphia, Pa. During the Second World War, he served as a major with the R.C.A.M.C. and was severely wounded during the Battle of Britain. For some time he had been connected with the R.C.M.P. in Regina as head of their laboratory of criminal medicine there. Surviving are his widow, one son, and three sisters.

Le docteur J.-William Ouimet est décédé le 4 mai, en son domicile de Montréal, à l'âge de 71 ans. Il naquit à Terrebonne. Médecin-chirurgien, il exerca sa profession à Oka de 1903 à 1925, et à Montréal de 1925 à 1943. Il laisse six fils, deux filles et deux frères.

Dr. F. A. Richard, of Moncton died at the Hotel Dieu Hospital on May 26, after a short illness. He was a native of Richibucto. He obtained his B.A. from St. Joseph's University in 1895 and graduated in medicine from McGill University in 1900. He practised first in Chatham, N.B., and for forty years he was an outstanding physician in Moncton. For thirty years he was radiologist at the Moncton City and Hotel Dieu Hospitals, and was widely known as a perfectionist in radiographic techniques. For the past five years he has lived in retirement. He was a friendly gracious gentleman, with a multitude of friends, who respected his many social and professional qualities. He is survived by two sons, one of whom is Dr. Arthur L. Richard, of Ottawa and two daughters.

Dr Emile Ruel de Rouyn, a succombé le 3 mai à une crise cardiaque, à l'âge de 50 ans. Il laisse dans le deuil, son épouse, une fille et trois sœurs.

Dr. Louis Philippe Sauvé, aged 54, a physician in Lachute for the past 25 years, died suddenly at his home on April 23. Born in St. Hermas he studied medicine at the University of Montreal, and some years later—while practising here in the 'twenties—took a course of study in Paris. Dr. Sauvé was predeceased by his wife a little over a year ago. He is survived by his son, and two daughters.

Dr. F. W. Schroeder died in an automobile accident on May 25, near Imperial, Sask. He was head of the surgery department at Regina General Hospital. He was returning with his family from a vacation trip. His widow and three children are in hospital in Imperial, all critically injured.

Dr. Archibald Clayton Sinclair died at his home in Victoria, B.C., on May 6. Sixty years of age, he was one of the best-known Victoria doctors, having practised here since 1911. He was born in Fingal, Ont. Graduate of University of Toronto, he spent one year as intern at Royal Jubilee Hospital before starting his own practice. During the Great War he served overseas in the Royal Canadian Army Medical Corps. He was a staff doctor of St. Joseph's Hospital. Dr. Sinclair was an ardent fisherman and spectator and supporter of a number of sports. He is survived by his widow, one daughter, and four sisters.

Dr. Douglas G. Storms died on May 22 at Hamilton, Ont. He graduated in medicine from Queen's University. For 52 years he served his community actively and ably as an outstanding obstetrician, and until his retirement in 1938, lived a most active life. Born at Odessa in 1857, he came from United Empire Loyalist stock. He was a past president of the Hamilton Horticultural Society, a member of the Canadian Order of Foresters and of the Barton Lodge AF&AM No. 6, GRC, and the Scottish Rite Club. He is survived by his widow and two sons.

Dr. Alphonse A. Thibaudeau head pathologist at Roswell Park Memorial Institute, Buffalo, N.Y., died at his home on April 20 after one week's illness. He was 64. Born in Chatham, Ont., February 2, 1885, Dr. Thibaudeau attended the Chatham Collegiate Institute, Laval University at Quebec and the University of Toronto Medical School. Before going to Buffalo in 1907, he was the assistant bacteriologist for the Ontario Health Department. During World War I, he served on the Medical Advisory Board No. 43. He then went into private laboratory work until 1924, when he became associate cancer pathologist in the New York State Institute for the Study of Malignant Diseases, now known as Roswell Park. He is survived by his widow, two sons, and six daughters.

Dr. Marchant Beckett Whyte died in Toronto on April 13. He graduated in medicine from the University of Toronto in 1910.

Dr. George Albert Woodruff died at Palm Beach, Ont., on May 1. He graduated in medicine from Queen's University in 1901.

NEWS ITEMS

Alberta

We, of Alberta and I am sure the rest of Canada regret the untimely passing of Dr. A. E. Archer, of Lamont, a pioneer medical missionary and famous surgeon of this Province. Further details will be noted in the obituary column.

The Annual Refresher Course was held at the University of Alberta during May. Many fine clinics and presentations were made both by the visiting speakers and the staff. The largest attendance to date was noted.

Now that Edmonton is on the North Star T.C.A. direct line East and West much time is saved by the medical men in their travelling schedule; the southern cities have had this advantage for some time. A number of men will be taking advantage of this route when going to Saskatoon for the annual meeting.

Dr. Morley Young of Lamont and Dr. R. C. Riley of Calgary, were recent visitors to Edmonton while taking part in the Dominion Council examinations.

Dr. M. E. Tiffin of Edson was a recent visitor to the Edmonton hospitals.

Dr. A. C. Ross of Bellevue is leaving with his family for England to take further postgraduate work in thoracic surgery. Dr. Ross is a graduate of the University of Alberta and during the war was with the paratroops division.

Dr. P. H. Malcolmson is recovering in a satisfactory manner following a recent emergency operation while touring the West Coast.

Dr. F. D. Locke of Lacombe has returned to his practice following an illness of several weeks' duration.

Dr. H. E. Duggan is attending the meeting of Radiologists in Atlantic City and expects to be away two weeks.

We wish to congratulate the goodly number of medical men, with their wives, who have helped to increase the population of our fair Province. We learn that the doctors are standing up very well. Also to those who have most recently taken unto themselves life partners; there was quite a casualty list among the interns this year, yet all to the good.

The Edmonton Academy of Medicine held its last meeting of the season on the May Fair Golf course; many short "cases" were delightfully presented and the beautiful afternoon was enjoyed by all.

W. CARLETON WHITESIDE

British Columbia

At the Annual Meeting of the Vancouver Medical Association, held on May 3 the following were elected to office: *President*—Dr. W. J. Dorrance; *Secretary*—Dr. W. G. Gunn; *Treasurer*—Dr. Gordon Burke.

Mr. Clyde Gilmour, of the Editorial Department of the *Vancouver Sun*, was the Guest Speaker and spoke on "Publicity—Good Medicine for the Doctors".

The Summer School of the Vancouver Medical Association was held from May 31 to June 4 inclusive at the Hotel Vancouver. The names of the speakers were given in a former notice. The meeting was a great success and was well attended, with many visitors from out of town. The addresses were excellent, and especially directed to the general practitioner of medicine.

The cancer campaign which was conducted during April and May throughout British Columbia, has been very successful, and has passed its objective. This is also true of the Red Cross Campaign. They had aimed at a total of $500,000 and passed this by some $45,000. Hon. E. W. Hamber, the Chairman of the Drive in British Columbia made this announcement. He attributed the success of the Drive in some part to the appreciation by the people of British Columbia of the magnificent work done by the Red Cross in the disastrous floods of 1948.

Two cases of rat-bite fever are recorded in North Vancouver. Dr. Stewart Murray, Senior M.H.O. for the Metropolitan Health Committee, states that this is the first instance in Greater Vancouver in which this disease has been recorded. As in all cities, rats are a serious problem in Vancouver, and much work is constantly being done on rat prevention and destruction.

The North Pacific Orthopædic Association held its Annual Meeting in Vancouver during May. The session occupied two days and among other speakers were Dr. Roger Anderson of Seattle, Dr. J. F. Abele, Tacoma, Dr. E. M. Burgess and Dr. D. G. Leavitt of Seattle, and Dr. D. E. Moore of Eugene, Oregon. The meeting was held under the presidency of Dr. John R. Naden of Vancouver.

The new Tuberculosis Institute of British Columbia was opened in Vancouver late in April. This will be the centre of tuberculosis control for British Columbia. It contains the most modern operating theatres and equipment for diagnosis and treatment. The facilities for modern thoracic surgery are unsurpassed in any centre. A large and well-designed auditorium is part of the building, and will be used for teaching purposes, as well as for entertainment.

The annual graduating exercises of the Vancouver General Hospital were held during May, and one hundred nurses received their diplomas. The Nursing School also celebrated its golden anniversary this year. A banquet which was sponsored by the Alumnal Association of the Vancouver General Hospital Nursing School marked the end of the celebration.

Dr. John Stokes, director of the Institute of Syphilis Control of the University of Pennsylvania, and noted dermatologist of Philadelphia, was a visitor in Vancouver during May, and addressed several meetings, including a special meeting of the Vancouver Medical Association. He was much impressed by the system of venereal disease control in British Columbia, which he described as one of the best in the world. He found the "incidence of V.D. here very low, and the control very good".

The recent death of Dr. C. H. Hankinson of Prince Rupert means a severe loss to the profession of British Columbia. Dr. Hankinson was one of the leaders of the British Columbia profession, was a past President of the British Columbia Medical Association, and was always most active in medical and medico-economic affairs. His wisdom and leadership will be sorely missed.

Dr. W. H. Lang of Vancouver, who had practised in that city for 40 years, has retired, and will live at Grantham's Landing.

Dr. Gordon James, of Britannia Beach, where he has practised for many years, died suddenly in Vancouver on May 18, 1949.

J. H. MACDERMOT

Manitoba

The new Carman Memorial Hospital was formally opened on May 5 by Lieut.-Gov. R. F. McWilliams. Built at a cost of $175,000 it has 43 beds and is completely equipped with operating rooms and a maternity wing. It will serve 12,000 people in the Carman area. The keynote address was given by Dr. Morley Elliott, director of the local health unit in the new hospital. The duty of a hospital, he said, was to care for all health needs, not solely for people who required hospitalization. Hon. Ivan Schultz, Minister of Health, presented a cheque for $69,999 the first payment of a special $90,000 Dominion-Provincial grant to the Carman Hospital.

The Shriners' Hospital for Crippled Children at 611 Wellington Crescent, Winnipeg, was opened for inspection on May 3, and 2,000 people thronged through the halls and wards. Built for Khartum Temple on a beautiful site overlooking the Assiniboine River, it will be ready for patients by the middle of June. The one and one-half storey building of fireproof construction, modern in every way, will accommodate forty patients. Adjoining it is a nurses' home. The mural paintings are a special feature of the building.

The Princess Elizabeth hospital, owned and operated by the City of Winnipeg is nearing completion and was recently inspected by Mayor Coulter and the aldermen of the council. It will be the first large hospital in Western Canada entirely devoted to chronic diseases and geriatrics and will relieve the pressure on the other hospitals of Winnipeg. Built at a cost of $1,000,000 to house 208 patients it is expected to be opened September 1.

The new quarters of the West Kildonan dental clinic and the Kildonan-St. Paul health unit in Centennial School were formally opened on May 7 with Hon. C. Rhodes Smith Minister of education and Hon. Ivan Schultz, minister of health, as the guest speakers.

In an area north from Churchill to Chesterfield Inlet west to Baker Lake and south to the Manitoba border about 90 cases of poliomyelitis have occurred among the Eskimo inhabitants. On two occasions teams of doctors have been flown in to investigate the outbreak which caused death and paralysis. Dr. W. J. Wood, regional

superintendent for the Dominion Department of Health, has stated he would recommend to the Dominion Government the establishment of a treatment centre in Manitoba for the Eskimo victims. In the area mentioned a quarantine will be imposed for several months.

Dr. A. T. Mathers, dean of the Faculty of Medicine, University of Manitoba received the honorary degree of Doctor of Laws at the Convocation on May 18.

A special train will leave Winnipeg on June 18 to carry ex-patients and former staff members to the Manitoba Sanatorium at Ninette for a reunion. The sanatorium was started in 1910 and has ministered to thousands.

The Fort Garry branch of the Canadian Legion plans to put into operation a free blood bank service for everybody in the municipality. The branch is signing up voluntary donors among its members and the public. Winnipeg General Hospital blood bank will be used, donors replacing any blood used by Fort Garry residents.

This year the University of Manitoba will have the largest graduate class, 1,465, in its 72-year record. The graduates in Medicine number 58. Dr. John Maxwell Bowman topped the class with five medals: the Manitoba Medical Association gold medal for the highest standing on the first four years of the course; the Dr. Charlotte W. Ross gold medal for highest standing in Obstetrics; Chown gold medal and $50.00 for highest standing in Medicine throughout course, and Chown gold medal and $50.00 for highest standing in surgery throughout course.

ROSS MITCHELL

New Brunswick

Dr. W. J. Murphy, of the Medical Staff of Lancaster Hospital, D.V.A. at Fairville, N.B., is taking an extended course in cardiology at the University of New York.

Dr. Ross Wright of Federicton, received the order of Serving Brother in the order of Saint John, at an investiture, conducted by Lieut.-Gov. D. L. MacLaren, recently.

Dr. P. J. Dowd, of Sussex, has received his pilot's license as a member of the Fundy Flying Club, under the new government regulations.

Dr. J. A. Melanson, chief medical officer, for New Brunswick, presided at the semi-annual meeting of Public Health Officers of the Province at Fredericton, early in May. The Minister of Health, Hon. Dr. F. A. McGrand, addressed the conference.

Dr. Norman Skinner, of Saint John, appeared on invitation, at the last meeting of the Medical Society of Charlottetown and presented a paper on arteriosclerotic heart disease.

Dr. W. J. Fisher, of Saint John, attended the inaugural meeting of the Canadian Neurological Association, and following that the meeting of the American Psychiatric Association in Montreal.

Dr. D. F. W. Porter, has resigned his position as director of Hospital Services, with the Department of Health of New Brunswick, to take effect September 1, this year. Dr. Porter joined the Public Health Service in June, 1947, and has in these past two years done a very important work in the health field in New Brunswick. His background of general practice in a rural community, practice as a specialist in pædiatrics in Saint John and subsequently administration experience in the R.C.A.M.C. in the past war was of the greatest value in his work with the Department of Health. His pleasant but forceful and tactful personality was appreciated in his public relations and his sincerity and integrity made him a place of unusual usefulness in public health in this Province. His aid in the establishment of the Cancer Diagnostic Services will be long remembered by the Cancer Society and the New Brunswick physicians and public. He had prepared plans for the implementation of the cancer treatment program in New Brunswick, which only awaited action by the provincial government. His medical colleagues, throughout Canada, wish him well in whatever field he now enters and regrets his departure from the Provincial Public Health field.

Dr. C. L. Emerson who has been senior surgeon at the Saint John General Hospital for some years resigned in May and Dr. John R. Nugent was selected to be senior surgeon and chief of staff. Both of these surgeons have had a long, faithful, and distinguished service on the staff of the General Hospital.

A. S. KIRKLAND

Nova Scotia

A three day session for Hospital Administrators of the Maritime Provinces was held at the Victoria General Hospital in June.

Dr. J. F. Cantwell, a member of the graduating class this year in Medicine at Dalhousie University, has gone to Grand Falls, Newfoundland, to practise.

Dr. Lawrence Sutherland, who spent the past year in Newfoundland, has returned to Nova Scotia to join the resident staff of the Victoria General Hospital in the Department of Surgery.

Dr. G. R. Clayden will shortly go to River Hebert to associate in practice with Dr. D. M. Cochrane.

Dr. D. S. Brennan, has purchased the practice of Dr. A. B. Campbell at Bear River. Since Dr. Campbell was appointed Chief Medical Officer of the Workmen's Compensation Board of Nova Scotia, a number of young physicians have covered this busy and extensive practice.

Dr. Helen M. Hunter of Halifax, will shortly assume her duties as Resident in the Herbert Reddy Memorial Hospital, Montreal. Also to do resident work in Surgery is Dr. L. S. VanBlaricom, who will go to Englewood Hospital, Chicago.

Dr. H. G. Grant, Secretary of the Medical Society of Nova Scotia, and Dean of Medicine at Dalhousie had the pleasure of escorting a number of medical friends on a fishing trip, immediately following Convocation at Dalhousie. Reports indicate that from all points of view the trip was highly successful—and they caught some fish.

H. L. SCAMMELL

Ontario

The Ontario Cancer Treatment and Research Foundation has awarded $94,500 in grants for laboratory and clinical cancer research. University of Toronto received $67,230; Queen's $4,600; University of Western Ontario $9,230; McMaster University and Royal Botanical Gardens in Hamilton $3,600; Hospital for Sick Children, Toronto $8,300 and Women's College Hospital, Toronto $1,000. The successful applicants for these grants include twenty-one doctors and scientists. The Foundation has spent $370,000 since beginning its cancer research in 1944.

During his recent visit to Canada Mr. Tudor Thomas of Cardiff, Wales, demonstrated his operation for corneal transplant at Toronto General Hospital.

Members of Canadian, British and American artificial limb research organizations held a four day convention at Sunnybrook Hospital in May. Hosts were the National Research Council's Artificial Limb Committee and the War Amputations of Canada. Guests were the British Ministry of Pensions Artificial Limb Committee and the United States National Research Council Advisory Committee on Artificial Limbs. Dr. R. I. Harris of Toronto was chairman, Dr. Paul E. Klopstez headed the American delegation, while the British organization was represented by Dr. A. W. J. Craft.

Dr. W. Jacobson, Cambridge University, England, addressed the Toronto Physiological Society on "Peteridine Compounds and their Action on the Normal and Pathological Bone Marrow".

In 1948 the Ontario Workmen's Compensation Board dealt with 180,000 accidents. The Board has difficulty getting the surgeons to submit their accounts; some dating as far back as 1941 and 1942 have recently been received. The Board cannot accept responsibility for outstanding accounts after October 31, 1949, unless extenuating circumstances exist, about which the Board must be promptly advised.

Under the Alcoholism Research Foundation Act the following have been appointed members of the hospital board; Hon. J. Earl Lawson, chairman; Mr. J. J. Page, Mr. W. T. Sutton, Mr. Harold Sewell, Mr. Isaac McNabb, Dr. H. T. Kerr and Judge Hawley Mott, all of Toronto.

The Ontario Health Survey Committee, appointed September 9, 1948, to make a survey of existing health, hospital and related facilities and services has established the following committees by authority of the Minister of Health: (1) for the Toronto Metropolitan Hospital study, twenty members; (2) on the provision of nursing care, 25 members; (3) on crippling conditions in children, 12 members; (4) on mental facilities and services, 17 members; (5) on prevention, treatment and control of tuberculosis, 14 members; (6) on dental services in Ontario, 12 members; (7) on hospital facilities and services, 20 members; (8) on medical manpower in Ontario, 10 members; (9) on the control of cancer, 12 members.

The Health Department at Ottawa has granted $11,000 for increased research in tuberculosis to be carried on at the School of Hygiene, University of Toronto.

Dr. E. W. McHenry, chairman of the Ontario Interdepartmental Nutrition Committee, recently met representatives of thirty organizations including medical, dental, welfare, agricultural and women's groups to plan nutrition activities, prepare and distribute literature on the subject, and to consider the most effective methods of education of the eaters. One-sixth of Ontario adults are overweight; three-fifths of the women in pre-natal clinics are not drinking enough milk; one-half of the pre-natal patients are not getting enough fruit and are eating too much sugar.

The Ontario Society of Radiographers, at their annual meeting in Hamilton, were told by their president, Mr. John Collings, St. Catharines General Hospital, that conditions dangerous to the health of technicians exist only in hospitals in smaller communities where radiographers are being overworked to the point where they absorb dangerous radiation. In the larger hospitals the new x-ray machines have lead shields behind which the operator stands; radiographers are given one month's annual vacation and their blood is examined twice a year.

Dr. Robert B. McClure, F.R.C.S.(Edin.), who has spent many years in China, has been appointed surgeon to the Yarmey Clinic, Toronto.

Dr. Herbert Levitt of Toronto is a member of the teaching faculty at the Orthopædic Course given at Nasson College, Maine and at the Lancaster Course under the direction of Dr. Parker Heath of Harvard; he will return in August.

Dr. William Ogden of Toronto has returned from Trinity College, Cambridge, England, where he had been invited to address the British Tuberculosis Association on "Twenty Years' Observations on the Development of Pre-Clinical and Clinical Tuberculosis". His talk was illustrated by slides. Trinity College accommodated the three hundred members of the Association during Easter season while the students were home. The stone buildings with their varied styles of architecture, with their history and traditions had a special appeal; but the temperature of the rooms, the Common Room was the only one heated, made the visiting Canadian shiver, in spite of extra clothes. The weather was comfortably warm the following week in London, where there were throngs in the parks with every chair occupied. Dr. Ogden stayed at the Junior Army and Navy Club, Whitehall, where the Strand, the Embankment, Charing Cross Station, Trafalgar Square, Westminster Abbey and the Houses of Parliament are within walking distance. Hotel food seemed adequate with its daily kipper for breakfast. The trip by B.O.A.C. and the month in England was thoroughly enjoyable.

Dr. A. L. Chute addressed the Ontario Dental Association on "Endocrine Factors Affecting Growth", at their eighty-second annual meeting.

Dr. Edna Guest and Dr. Agnes White of Toronto have gone to Europe to attend the meeting of the Council of International Federation of Medical Women at Helsinki, Finland. Their trip also takes them to Copenhagen and Sweden where they are to visit hospitals and clinics.

LILLIAN A. CHASE

Dr. H. S. Doyle, formerly with the Saskatchewan Health Department, has been appointed Assistant Medical Superintendent at the Toronto General Hospital.

Dr. George McGarry has been elected President of the Niagara Falls Medical Society for 1949. Dr. Margaret Bickle is Vice-president and Dr. Donald Campbell Secretary-Treasurer.

Dr. Isaac T. Weldon of Midland has been appointed Coroner for the County of Simcoe and District of Muskoka.

Dr. L. A. Wilford, of Wiarton, has been elected President of the Bruce County Medical Society for 1949. Dr. F. M. Williamson, of Wiarton, is the new Secretary-Treasurer.

Dr. Harold B. Cotnam has been appointed Coroner for the County of Renfrew.

Dr. Robert L. Noble, son of Dr. Robert Noble, Toronto, has been named Head of the Department of Physiology at the University of Western Ontario. He graduated from the University of Toronto and later obtained degrees in Philosophy and Science from the University of London, England.

NOBLE SHARPE

Quebec

A dinner was held at the Montreal Club on Saturday, May 14, in honour of Dr. C. F. Martin, former Dean of the Faculty of Medicine, McGill University, and emeritus Professor of Medicine. The dinner was given by the staffs of the three teaching hospitals of the University, the Children's Memorial, the Montreal General, and the Royal Victoria, and was attended by a large number. Most of those present were former students and interns under Dr. Martin, whose long career of teaching and professional work received proper tribute from several of those present.

General

American Association of Blood Banks Annual Meeting. The second annual meeting of the American Association of Blood Banks will convene in Seattle, Washington, at the Olympic Hotel November 3, 4, 5, 1949. An excellent program is being arranged which will be of interest to both scientific and administrative personnel of blood banks and hospitals. For further information contact the office of the Secretary, 3301 Junius Street, Dallas 1, Texas.

The American College of Physicians announces that a limited number of Fellowships in Medicine will be available from July 1, 1950 to June 30, 1951. These Fellowships are designed to provide an opportunity for research training either in the basic medical sciences or in the application of these sciences to clinical investigation. They are for the benefit of physicians who are in the early stages of their preparation for a teaching and investigative career in Internal Medicine. Assurance must be provided that the applicant will be acceptable in the laboratory or clinic of his choice and that he will be provided with the facilities necessary for the proper pursuit of his work. The stipend will be from $2,200 to $3,200. Application forms will be supplied on request to The American College of Physicians, 4200 Pine Street, Philadelphia 4, Pa., and must be submitted in duplicate not later than October 1, 1949. Announcement of awards will be made November, 1949.

The American Congress of Physical Medicine will hold its twenty-seventh annual scientific and clinical session September 6 to 10, 1949 inclusive, at the Netherland Plaza Hotel, Cincinnati, Ohio. All sessions will be open to members of the medical profession in good standing with the American Medical Association. In addition to the scientific sessions, the annual instruction courses will be held September 6 to 9. These courses will be offered in two groups. One set of ten lectures will consist of basic subjects and attendance will be limited to physicians. One set of ten lectures will be more general in character and will be open to physicians as well as to physical therapy technicians who are registered with the American Registry of Physical Therapy Technicians. Full information may be obtained by writing to the American Congress of Physical Medicine, 30 North Michigan Avenue, Chicago 2, Illinois.

The Second International Congress for the education of Maladjusted Children will be held in Amsterdam, Holland, July 18 to 22, 1949. At the same time there will be held in the Netherlands the first international camp for physically defective boy scouts, and probably also girl guides. The Secretary is Dr. Berthold Stokvis, Museum Flat, Weteringplantsoen, Amsterdam, C.

The Fourth International Neurological Congress will be held in Paris, September 5 to 10, 1949, under the chairmanship of Professor Th. Alajouanine, of the Faculty of Medicine of Paris. A warm welcome is extended to any Canadian neurologists, neuro-surgeons and psychiatrists who may wish to attend. It would be appreciated if anyone planning to make this visit will communicate with Dr. T. C. Routley, General Secretary of the Canadian Medical Association, 135 St. Clair Avenue West, Toronto.

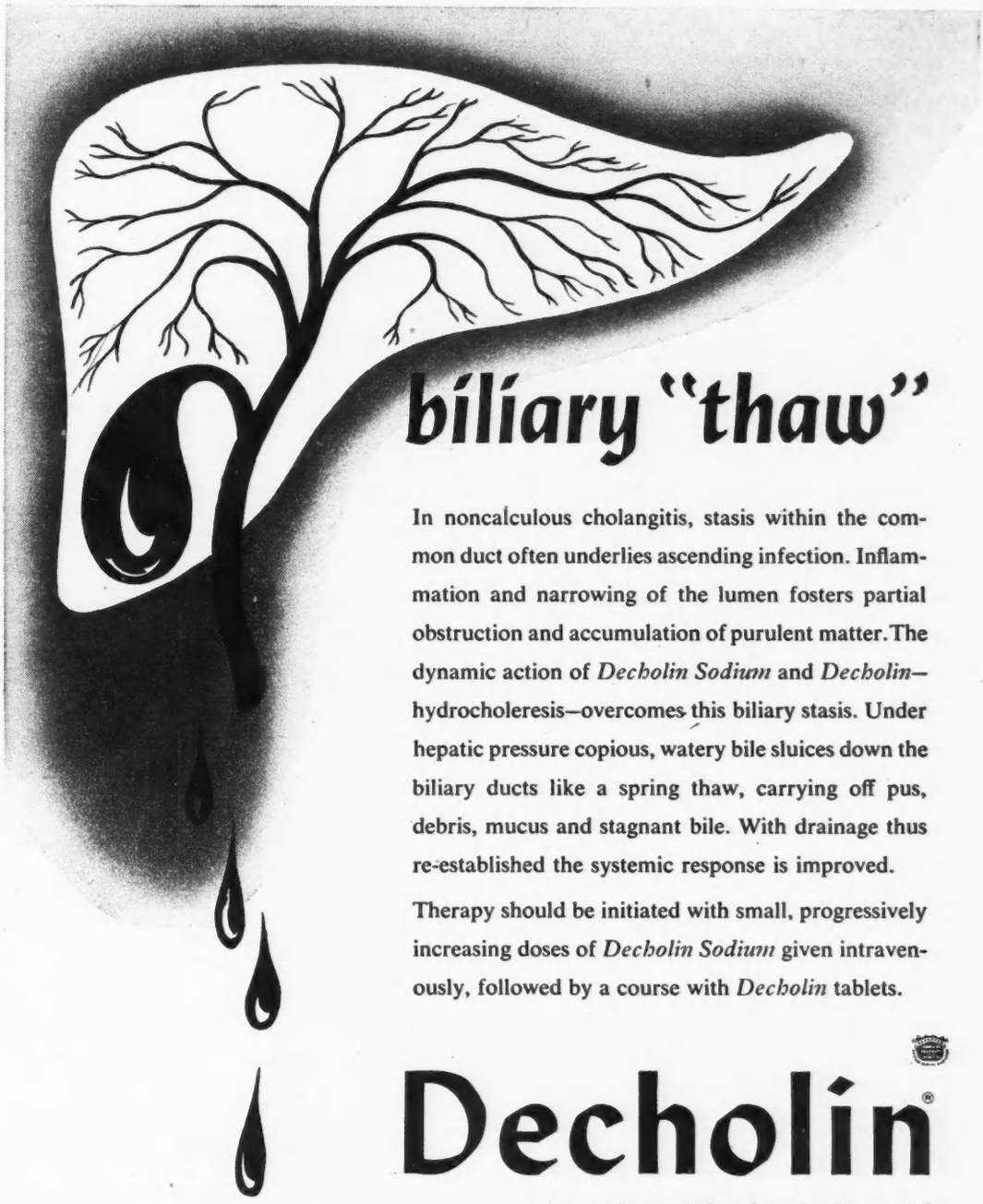
National Cancer Institute. Grants of the Institute for fundamental research on cancer in Canada have increased from $84,000 to $225,000 over the last three years, it was announced at the third annual meeting of the National Cancer Institute of Canada, held in May in Ottawa. Satisfaction was expressed with the progress of the fundamental research program. One of the newer phases of this program is the attention now being given to ways and means by which cancer hazards in certain Canadian industries might be studied. To aid in the diagnosis of unusual tumours and to act as a central collection agency or tumour library, a Canadian Tumour Registry is being set up in Ottawa. This utilizes the technical facilities of the Federal Laboratory of Hygiene. Dr. Desmond Magner, Professor of Pathology, University of Ottawa is acting as registrar and a committee of consultants has been appointed, consisting of six outstanding Canadian pathologists. The registry is of special service to pathologists working in laboratories isolated from the larger medical centres.

At the meeting Dr. William Boyd, Professor of Pathology, University of Toronto, was elected President of the Institute while Dr. P. H. T. Thorlakson of Winnipeg was elected Vice-president. Other members elected to the Board of Directors are: Dr. G. E. Hall, President of Western University; Dr. L. C. Simard, University of Montreal; Dr. Ethlyn Trapp, Vancouver. The National Cancer Institute and the Canadian Cancer Society are affiliated in all complementary fields of endeavour.

International and Fourth American Congress on Obstetrics and Gynæcology will be held May 14 to 19, 1950, at Hotel Statler, New York City. The preliminary program for the scientific sessions is as follows: The morning meetings, Monday through Friday, May 15 to 19, are general sessions each devoted to one of five topics: (1) physiology of human reproduction; (2) the pathology of human reproduction; (3) social and economic problems; (4) neoplastic disease of the female reproductive system, and (5) obstetric and gynæcological procedures. The afternoons will be given over to meetings of various groups represented at the Congress, including nurses, nurse midwives, hospital administrators, educators, practising physicians, investigators in special fields and public health doctors and nurses.

The technical exhibit is under the direction of a special committee of which Dr. Woodard D. Beacham of New Orleans is chairman. Dr. John Parks of Washington, D.C., heads the committee in charge of the scientic exhibit. The committee in charge of arranging the motion picture program is under the direction of Dr. Archibald D. Campbell of Montreal. Applications for space in the scientific exhibit or for time on the motion picture program should be submitted to the chairman in charge of these activities on official application blanks obtainable from the business office of the international congress at 24 West Ohio Street, Chicago 10, Illinois. All inquiries pertaining to the meeting should be addressed to the Chairman of the International and Fourth American Congress on Obstetrics and Gynæcology, Dr. Fred L. Adair, at 24 West Ohio Street, Chicago 10, Illinois. Mr. Karl S. Richardson is Business Manager.

Appointment of Dr. Gordon E. Wride of Regina as an assistant director of health insurance studies in the Department of National Health and Welfare is announced by the Department of National Health and Welfare Minister. He will assist Dr. F. W. Jackson, director of health insurance studies, in the development and administration of the $30,000,000 federal health program. Dr. Wride was, until he came to Ottawa, director of hospital planning and administration in Saskatchewan.



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BOOK REVIEWS

Elements of Genetics. E. C. Colin, Chicago Teachers College. 402 pp., illust., 2nd ed. $3.50. The Blakiston Co., Philadelphia and Toronto. Reprinted June, 1947.

Man, like other living organisms, is made up of parts or "characters", and there is a tendency for these to develop specifically under favourable environmental conditions by means of a heredity mechanism consisting of genes and intergenal material, organized during mitosis into chromosomes. Genes are viewed as complex protein molecules. Claims have recently been made that these can be "seen" with the electron microscope. A gene that transforms females into males is cited. Mutations, as Mendel taught, give rise to varieties and even species. Mutations sometimes occur naturally in genes, and their number may be augmented enormously by irradiation, as with x-rays. A change in character through mutation may, however, be injurious. The genes function for the most part as independent units, acting in the chromosome like a row of chemists in a laboratory in efficient co-ordination. "Characters" are always products of the interaction of genes and environment. An interesting comparison of genes and viruses is made.

An effort has been made here to apply this gene-concept to problems in human heredity. Schizophrenia, for instance, has been thought by some investigators to be due to a single gene, and by others to two pairs of recessive genes. A pedigree of polycystic kidney suggests a dominant gene. Possible combinations of dominant and recessive genes in the origination of the various blood groups are considered. Wiener suggested that the five kinds of Rh factor depend on a series of five alleles, an allele being one of two or more alternative hereditary units or genes, or of the characters associated therewith. For example, the gene responsible for color blindness is an allelomorph (allele) of the alternative normal gene.

Evolution is viewed in the light of heredity. Using modern methods of calculation, involving our newer knowledge of radioactive elements, the age of the earth is estimated at two billion years, and "if life has existed on the earth for three-fourths of this time it is perhaps adequate for the purposes of evolution". An impressive vista of time for future evolutionary purposes is opened up. Speculations as to the future of man, a comparative newcomer on the earth, are made. His brain has enabled him "to become the most numerous, the most varied, and the most widely distributed of all the larger mammals". By its action he can exercise much control over his environment. Chapter 16 is concerned with a discussion of means of improving man by means of genetic science. Promotion of education and research in genetics is enjoined. "No type of learning has greater possibilities."

A few peculiarities were noted; for instance "joint", which anatomically means an articulation between two bones, is here used (p. 157) for phalanx. The book is to be recommended for those involved in medical education at whatever level—at teaching and receiving ends. Since the first edition in 1941 there has been added a great amount of new knowledge gained from genetic research.

Management in Obstetrics. A. M. Claye, Professor of Obstetrics and Gynæcology, University of Leeds. 186 pp., illust. $3.75. Oxford University Press, London, New York and Toronto; McAinsh & Co. Ltd., Toronto, 1948.

This small book is well laid out and deals with management in obstetrics in a somewhat dogmatic manner. The consideration of home rather than hospital care and the place of midwives are in the author's mind all through the book. Chapters one to eleven deal with prenatal care, supervision and some of its problems. Further chapters deal with deliveries in normal and abnormal cases; then go on to operative obstetrics *per vaginam*. Repairs and postpartum treatment are discussed in chapters twenty-six to thirty-one. The remaining chapters discuss breast feeding, consultations and instructions regarding care and prevention of infection. There are a few diagrams and pictures. Subjects are arranged in a clear and logical manner, giving the reader a clear picture. Controversy has been avoided and there is a minimum of reference to other works. In a work of this kind it is a matter of difference of opinion rather than criticism. Lack of stress on weight gain in the prenatal period, the use of progestin in abortions and dismissal of episiotomy are points in mind. The book covers well the common procedures in this field of medicine and would be an aid to those who are doing obstetrics along with general practice. It should be read by general practitioners and graduating students.

Surgery of Abdominal Hernia. G. B. Mair, Surgeon, Law Junction Hospital, Lanarkshire. 408 pp., illust. $7.50. Edward Arnold & Co., London; Macmillan Co. of Canada Ltd., Toronto, 1948.

The book is divided into twenty-five chapters included in which are considered in detail anæsthesia, etiology, criteria for operation, etc. The economic and legal significance of hernia are brought out in a single section. In the reviewer's opinion this is a very valuable addition to the text, as references to legal matter pertaining to hernia are difficult to find in journals. Cutis and whole skin grafts in hernia are described in some detail. Of the two methods, the author apparently prefers the whole skin graft. He has operated on 180 inguinal hernias with this method, with only 0.71% recurrence, after a three-year review of cases. Injection treatment of hernia, never popular in Britain, is dismissed in two pages. The author does not give his personal experiences but quotes American surgeons for technique and ultimate results. Fascial technique has established for itself a definite place in hernia repair, chiefly in recurrent hernias. Among the disadvantages of fascia, pain in the thigh is cited. This reviewer does not recall a single complaint referable to the thigh in well over one thousand fascial repairs. All in all this is an excellent textbook and will give all the information any surgeon requires relative to the condition.

National Formulary 1949. 123 pp. 2/6. The British Medical Association, Tavistock Square, London, W.C.1, and The Pharmaceutical Press, London, W.C.1.

This is a compact, up-to-date formulary, with some additional miscellaneous notes on barbiturates; enemas; hormones; liver therapy; sulfonamides. There are some slight differences from corresponding Canadian publications, but it can be recommended as well arranged and practical.

Preoperative and Postoperative Care of Surgical Patients. H. C. Ilgenfritz, formerly Assistant Professor of Surgery, Louisiana State University School of Medicine, with foreword by Urban Maes, Emeritus Professor of Surgery, Louisiana State University School of Medicine, New Orleans. 898 pp., illust. $11.00. The C. V. Mosby Co., St. Louis; McAinsh & Co. Ltd., Toronto, 1948.

This is an all-encompassing reference text of 834 pages. Included between the covers of this volume are all the generally accepted current principles and practices of pre- and post-operative care. The controversial subjects are only mentioned and not stressed. References are widely quoted. The text is illustrated and in some instances the illustrations are particularly useful; the section on the management of atelectasis is an example. Of particular interest is the section dealing with coronary heart disease in the surgical patient. The author stresses the not so well known statistical fact that such heart disease does not materially increase the surgical mortality rate. One of the most important chapters in the advance of surgery is that dealing with fluid and electrolyte balance and metabolic rehabilitation. There

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is a current tendency to overtreat patients by means of intravenous infusion. The dangers of salt solution are mentioned. The remote dangers of blood and plasma transfusions are not mentioned. In general this in an excellent book. Its chief virtue is the compilation of all the scattered facts relating to the various aspects of pre- and post-operative care of surgical patients. Since these aspects of the practice of good surgery are as important as the technical aspects, this volume can be recommended.

Recent Advances in Endocrinology. A. T. Cameron, Professor of Biochemistry, Faculty of Medicine, University of Manitoba. 443 pp., illust., 6th ed. $6.00. The Blakiston Co., Philadelphia and Toronto; Doubleday Publishers, Toronto, 1947.

This sixth edition varies little in general outline from that of previous editions. Each endocrine gland is considered in some detail but in this rapidly expanding field it is impossible in a volume of this size to incorporate all recent advances. The title therefore is somewhat misleading. Therapeusis is considered only in general outline so that to the general practitioner it will be wanting in this respect. The thyroid gland is reviewed in considerable detail. Inclusion of the so-called hypometabolic state and a discussion of Farquharson's contribution would have been constructive. The parathyroid glands are excellently reviewed. The etiology of diabetes mellitus is considered somewhat incompletely. Globin insulin is mentioned briefly. The chemistry and pharmacology of the steroid hormones is adequately covered. With so much research being done on the adrenal gland, it is felt that more space might have been allotted to this section. The theories of Albright which attempt to explain the *modus operandi* of Cushing's syndrome might have been included. The 84 pages devoted to Reproduction incorporate most of the important contributions on the subject. Again therapeutic advances are incompletely recorded. Fundamental concepts of pituitary physiology and pathological states associated with this gland are reported clearly and concisely. The reader is briefly introduced to the inter-relationship of antihormones. The two pages allocated to the inter-relationship of glands is incomplete. The reviewer finds that this volume will be of considerable assistance to the student of endocrinology.

Rural Health and Medical Care. F. D. Mott, Director, Saskatchewan Health Services Planning Commission, Regina, Saskatchewan, and M. I. Roemer, Morgantown, West Virgina. 610 pp., illust. $7.80. McGraw-Hill Book Co. Inc., New York, Toronto and London, 1948.

This is a study of the health of the people of the United States with particular reference to people living in rural areas. Rural populations, their economy, community services, mortality and morbidity are briefly reviewed and compared with the populations of large cities and of small towns. The medical services available to these groups of people are considered under various headings. It is concluded that the volume of health services is, in general, in proportion to income, and that the rural areas suffer most severely from deficient health services, both in quantity and quality, largely because of low level of income. Efforts to improve rural health, as made by governments and by voluntary health agencies, are discussed and attention is given to voluntary prepaid health insurance plans. All these programs seem to be piecemeal and the conclusion is that national compulsory health insurance offers the only hope of bringing adequate health services to the rural areas within a reasonable length of time. It is contended that voluntary means of health insurance fail to reach a large segment of the population—the segment that needs it most, because of inability to purchase it.

This work is a very scholarly one and contains a large amount of highly valuable information. Canadian readers may wonder how applicable to the Canadian scene is the information presented. We do not have, for example, a large negro population. However, we do have large groups of populations that have lower health standards than the average general population. The reviewer feels that the authors indulge in too much speculation in their interpretation of some of the many graphs and tables which present essential data. They point out that the general death rate is lower in the rural areas than in the urban areas and that country people live a little longer than their city cousins. These facts would seem to need more elucidation than is given. Their very unflattering portrait of the typical "American rural physician" seems much overdrawn. The voluntary health insurance movement is dealt with too briefly. Nevertheless, this book is a valuable contribution to the growing literature of the health of the people of this continent. It should be read by all those who are interested in medical economics, particularly those working with voluntary prepaid medical care plans. It is a clear exposition of the reasons given by those who favour the establishment of national compulsory health insurance as a means of improving the health of the American nation.

Sterility and Impaired Fertility. C. Lane-Roberts, Gynæcological Surgeon, Royal Northern Hospital; A. Sharman, Senior Assistant Surgeon, Royal Samaritan Hospital for Women, Glasgow; K. Walker, Jacksonian Prizeman and Hunterian Professor, Royal College of Surgeons; B. P. Wiesner, Consulting Biologist, Royal Northern Hospital; Mary Barton, First Assistant to the Fertility Clinic, Royal Free Hospital, London. 400 pp., illust. $6.50. Paul B. Hoeber Inc., Medical Book Department of Harper & Brothers, New York and London, 1948.

The publication of this new edition is justified by the advances which have been made in the study and treatment of sterility in the last ten years. Like the previous edition it will be of value both to the general practitioner and to the specialist. It is concise and at the same time comprehensive, so that it may be accepted as a guide in the investigation and treatment of an individual case and also as a reference in the whole field of the problem of sterility. A work such as this benefits from the collaboration of a number of authors each interested in a particular phase of sterility. It presents a careful appraisal of the many factors which may contribute to the problem. One is left with a feeling that the over enthusiasm for a particular approach which is the fault of many of the articles in the current literature is thus modified and presented in a more reasonable manner. Sterility and infertility is an increasing problem in our modern life. One is frequently faced today with a demand for advice on two very divergent questions —birth control, and aid in overcoming sterility. The present volume will be of great value to any who seek an answer to the latter question.

Textbook of Chiropody. M. J. M. Swanson, Cofounder of Edinburgh Foot Clinic and School of Chiropody. 212 pp., illust. $5.00. E. & S. Livingstone Ltd., Edinburgh; Macmillan Co. of Canada, Toronto, 1948.

This book was referred by the reviewer, who is a medical man, and knows very little about the detailed care of the feet which constitutes chiropody, to a chiropodist who belongs to the modern school, is therefore fully trained, and is much more competent to judge of the value of the book as a textbook on chiropody. He expresses the opinion that, viewed as a textbook, from the standpoint of modern American teaching, which is the standard for Canadian practitioners as well, since they all receive their training in the U.S.A., this book is rather too elementary to fit the needs of men trained on this side of the Atlantic, where the course of training necessary to obtain registration is a good deal more extensive than that given on the other side, from which the book comes. As far as it goes, he considers it well written, and he feels that as a *vade-mecum* or as a short

compendium of practice, it might serve a very useful purpose. But the examinations now set for final or graduation purposes could not be adequately met by the information contained in this book, and it would not, therefore be sufficiently complete to serve as a textbook of chiropody. The writing is excellent, as might be expected from an author with the degree of B.Litt., and it is admirably illustrated. The author, who has been a teacher of chiropody for several years, adopts a very praiseworthy attitude throughout the book, in her insistence on the things that a practitioner should *not* do—procedures that he should not undertake—the necessity for constant co-operation with the medical man, and so on.

Treatment of Heart Disease. W. A. Brams, Associate Professor of Medicine, Northwestern University Medical School. 195 pp., illust. $3.85. W. B. Saunders Co., Philadelphia and London; McAinsh & Co. Ltd., Toronto, 1948.

The aim of this book is to provide "a systematic and practical guide in the treatment of heart disease" which might be of use to the general practitioner. The author has avoided discussion of many contentious points and recorded the methods of treatment which he has found most efficacious. The first third of the book is devoted to a consideration of the pharmacological and clinical aspects of the commonly used drugs in heart disease. The remaining chapters describe the therapeutic measures in the various types of cardiac illness. There appears to be little information in this volume which is not available in the standard texts. In a book devoted to therapy, one might anticipate more discussion of such problems as the place of the sodium ion and fluid intake in congestive failure, or the treatment of shock in myocardial infarction. These and similar problems are presented briefly, without theorizing and without comment upon the variety of views which have been expressed. It is felt that this book would be more useful had there been a more elaborate discussion of some of these points.

Twentieth Century Speech and Voice Correction. Edited by E. Froeschels, President, International Society for Logopedics and Phoniatrics. 321 pp., illust. $6.00. Philosophical Library, New York, 1948.

The foreword to this book states that its purpose is "to offer to persons scientifically and/or practically interested in speech and voice correction the latest development in this field". Special emphasis is placed on the current developments in the field of hearing. The chapters on hearing have been dealt with by recognized authorities. Dr. Helen Shick Lane of Central Institute for the Deaf, St. Louis, Missouri, discusses the Education of the Deaf Child. Dr. S. Richard Silverman, Central Institute for the Deaf, has contributed a chapter on Speech Reading for the Hard of Hearing, and Mary Wood Whitehurst of New York gives an account of the general plan of Hearing Rehabilitation for deafened servie men. Œsophageal Speech, one of the more recent developed phases of speech correction has been ably treated by Dr. Charles Strother, University of Iowa.

The discipline of each phase of speech and voice correction is so involved that a thorough description of the latest developments would necessitate a much wider coverage than is found in this volume. Therefore, the broad scope of the field is in part responsible for the book's failure to achieve its goal. The brevity of the majority of the chapters left the reviewer with an unsatisfied, and at times a bewildered feeling. The reviewer finds it difficult to evaluate all of the chapters in this book. Dr. Froeschels and several of the writers have received their training and have done most of their teaching as well as research work in foreign countries. Therefore, their interpretation of speech disorders and practical methods of treatment differ from those of the reviewer.

Widening Horizons in Medical Education. A Study of the Teaching of Social and Environmental Factors in Medicine, 1945-1946. 228 pp. $2.75. The Commonwealth Fund, New York; E. L. Hildreth & Co., Inc., 1948.

At first glance it is hard to see the need of a book of over 200 pages to tell what should be obvious, and no one would deny that the patient's special and environmental background frequently is of great significance in diagnosis and treatment. It must be admitted that, in driving this point home, some space is wasted on generalities that are uncontested. Yet, aside from the fact that the material is spread a bit thin in places, this book does have a value for those interested in medical education in that it serves to put in clear light a peculiar modern problem. The present day tendency to enlarge the rôle of the specialist and the sphere of the hospital in the medical students' training, valuable as this may be, has brought on the eclipse of the family doctor who was forced to know and appreciate sociological and environmental factors. This book emphasizes the problems involved and indicates valuable points of attack, and this gives it a definite place in the literature of medical education.

Clinical Roentgenology of the Digestive Tract. M. Feldman, Assistant Professor of Gastroenterology, University of Maryland. 901 pp., illust., 3rd ed. $8.00. The Williams & Wilkins Co., Baltimore; The University of Toronto Press, Toronto, 1948.

Dr. Feldman's well known textbook has again been brought up to date. Considerable additional information and several new illustrations have been added so that every phase of roentgen diagnosis of the gastro-intestinal tract is included. The text is now divided into twenty chapters. Most abnormalities are described under the following headings; incidence, etiology, symptoms, age and sex, roentgen diagnosis and differential diagnosis. This volume will find a welcome place in the libraries of radiologists, gastro-enterologists, internists and general practitioners interested in the investigation of the gastro-intestinal tract.

Fractures and Dislocations. E. O. Geckeler, Fellow of the American College of Surgeons. 371 pp., illust., 4th ed. $5.00. The Williams & Wilkins Co., Baltimore; The University of Toronto Press, Toronto, 1948.

On the jacket is stated: "In this fourth edition, new methods which have proved their worth have been added." These do not appear to have been many, in the opinion of the author, since there are a number of procedures, now in common use which are not mentioned. In the main, methods of internal fixation of fractures, with the exception of those of the upper end of the femur, where the author gives only his own method, appear to have been avoided. As a primer to teach one method of handling each type of fracture, this book may be excellent but as a reference book for the surgeon who is accustomed to treating fractures, it has nothing to offer.

Management of Common Gastro-intestinal Diseases. Edited by T. A. Johnson, Assistant Professor of Gastroenterology, Graduate School of Medicine, University of Pennsylvania. 280 pp., illust. $8.50. J. B. Lippincott Co., Philadelphia, London and Montreal, 1948.

This book does not pretend to cover the field of gastro-enterology. Sixteen topics are presented by different authors all of whom are well known and many of whom are noted authorities. While the subjects are, in the main, broad ones discussed in a sound and practical manner, a few express viewpoints which are not in accord with conventional opinion. More complete coverage of the main aspects of gastro-intestinal disease, with elimination of a few of those presented, would have made a very valuable contribution to the library of the average practitioner.